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ABSTRACT

Myths and tales from around the world about constellations and facts about stars in the constellations are presented. Most of the stories are from Greek and Roman mythology; however, a few Chinese, Japanese, Polynesian, Arabian, Jewish, and American Indian tales are also included. Following an introduction, myths are presented for the following 32 constellations which include the 12 signs of the zodiac: Andromeda, Aquarius, Aquila, Aries, Auriga, Bootes, Cancer, Canis Major, Canis Minor, Capricornus, Cassiopeia, Cepheus, Cetus, Corvus, Cygnus, Draco, Gemini, Hercules, Leo, Lepus, Libra, Lyra, Orion, Pegasus, Perseus, Pisces, Sagittarius, Scorpius, Taurus, Ursa Major, Ursa Minor, and Virgo. Many of the constellations are described in more than one story. Two tests with answer keys are included along with a pronunciation guide for the names of the constellations. This document is part of a collection of materials from the Iowa Area Education Agency 7 Teacher Center project. (DC)

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STARS AND STAR MYTHS

Developed by:

Oliver Eason
Science Department Head
Cedar Falls High School
Cedar Falls, Iowa 50613

Sponsored by:

The Teacher Center
Nellie Garvey School
2201 E. Mitchell Avenue
Waterloo, Iowa 50702

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Teacher Center Director - Diane Gibson, Ed. D.

Ronald Dickinson, Ed. D.- Chief Administrator, AEA 7

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INTRODUCTION

The sky is an evening's entertainment. It is free and there for the viewing on any clear night. The night sky is alive with meteors, the planets creeping slowly among the stars, and a vast gallery of imaginary figures - the constellations. And once in a while you may expect to see a comet, not to mention a host of artificial satellites racing this way and that among the background stars.

Once you know some of the many myths associated with the stars and constellations, the night sky becomes a splendid picture book brimming with adventures of mythical heroes, maidens, and monsters. With just a little practice you will soon learn to find your way among the more than thirty constellation figures described in this booklet, and before very long you will begin to feel very much at home with them.

On a clear night, from either the Northern or Southern Hemisphere you can see about 1,500 stars with the unaided eye. These stars range from first magnitude through sixth magnitude.

If we want to understand how and why the constellations came to be invented, and how they were used, we have to turn the clock back many thousands of years. We must return to a time when people looked on the night sky as a source of fear and comfort, of hope and despair, but most of all as a place of wonder and mystery. The sky also was a vast battlefield where gods and demons fought in deadly combat and from which they controlled the ways of man.

The sky was the calendar of ancient peoples. By remembering year after year that a certain star, or certain groups of stars, rose with the sun at dawn, or disappeared in the darkening sky just after sunset, they could predict the coming of spring, winter, and the other seasons.

We can be certain the ancient people looked on the blackboard sky, and the many events nightly chalked there, with wonder and mystery. Our evidence is the tapestry of fanciful stories about the stars, dating back at least 5,000 years ago, that have been handed down to us. Have fun as you learn about them.

ANDROMEDA, THE CHAINED LADY

Andromeda was the daughter of King Cepheus and Queen Cassiopeia. As pictured among the stars, she is seen stretched out at full length and chained by her ankles and wrists to a rocky island where she is being offered as a sacrifice to Cetus, the Sea Monster. To find out why she was chained there to be devoured by Cetus, turn to the story of Cassiopeia. To find out how she was rescued, then turn to the story of Perseus.

AQUARIUS, THE WATER CARRIER

When the zodiac was first laid out, Aquarius was the constellation in which the sun was located during the rainy season of the year. It seemed appropriate, therefore, to represent Aquarius as a giant who was holding a huge upturned urn or jar from which an unending stream of water was pouring down. All the rivers of the earth owed their waters to this torrential downpour, and their floods occurred when, from time to time, the water cascaded down from the urn faster than they were able to empty it into the seas.

Almost every country of the ancient world has handed down a story of a great flood which occurred long, long ago. Probably the most familiar of these flood stories is the account in the Old Testament of the time when it rained for forty days and forty nights and the only survivors were Noah and his sons, who, with their families, had taken refuge in the ark which God had warned them in advance to build. According to the story of that flood as it is told in Genesis, it was decreed because God had found "the wickedness of man great upon the earth."

For the same reason, it is said that Jupiter ordered a flood when he saw that people on the earth seemed to prefer war to peace, when crime was flourishing, and the old ideals of modesty, truth, and honor were being forgotten. The only survivors of this flood were Deucalion and his wife, Pyrram, who had taken refuge on the top of Mount Parnassus, the only place on the earth which was not covered by the flood waters. Because they were just and decent people, Jupiter allowed them to live, just as God saved Noah and his family, to become the founders of a new race which hopefully would be more worthy inhabitants of the earth.

One of the traditions handed down in the Old Testament regarding the flood in which Noah figured is that when it was over, God placed a rainbow in the sky as an everlasting sign to seal the agreement which he made with Noah that never again would he send a flood to destroy the world. This is the way that story is told in the ninth chapter of Genesis:

"I do set my bow in the clouds and it shall be for a token of a covenant between me and the earth.
And it shall come to pass, when I bring a cloud over the earth, that the bow shall be seen in the cloud.
And I will remember my covenant, which is between you and me and every living creature of all flesh; and the waters shall no more become a flood to destroy all flesh."

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Aquarius is sometimes identified as Ganymede, the young man who was kidnapped by the Eagle and carried to Mount Olympus to become the cupbearer of the gods. Instead of water, he is supposed to be pouring sweet nectar from his jar down into the golden cup of one of the gods.

In ancient times, the area of the sky in which Aquarius is the central figure was known as the Sea because of the many queer sea creatures that are found there.

AQUILA, THE EAGLE

Four birds - the Swan, the Crow, the Dove, and the Eagle - are found as constellations in the heavens. The first three were placed there by the gods. Only the Eagle had wings powerful enough so that he could soar high up into the starry sky and find his own place there.

The Eagle was Jupiter's favorite bird and was given many difficult tasks to do. Perhaps none was more difficult, none more greatly tested the power of his wings, than the time when he had to fly back to Mount Olympus burdened by the weight of a young man he had been sent to find to become the new cupbearer of the gods.

Hebe had been the royal cupbearer for a long time, but she had earned Jupiter's displeasure by the careless way she so often upset cups of nectar into the laps of the gods at the royal banquets. So Jupiter decided it was time to find a new cupbearer, and he sent the Eagle down to earth to look for and bring back the handsomest youth he could find.

The young man who caught the Eagle's eye and his fancy was Ganymede, the son of the king of Troy, who was peacefully tending his father's flocks when the Eagle swooped down, lifted him in its talons, and carried him up to Olympus, where his beauty soon made him a favorite not only of Jupiter but of all the gods, and more especially, of all the goddesses.

In Japan and in China, Aquila is linked with its neighboring constellation, the Lyre, in a myth which tells the sad story of a beautiful princess and her husband who were separated soon after their marriage and placed one on one side and the other on the other side, of a great river in the heavens. The river was so wide and its current so strong there was no possible way without assistance the lovers could cross it to be together again.. Once a year, however, there comes a special evening when they will have a chance to cross and meet again, provided only that the magpies keep a promise which they made to the lovers long ago.

Magpies, large black and white birds with long tails, are familiar sights in the fields all through Japan and China. On the seventh day of the seventh month, Chinese and Japanese children are permitted by their parents, indeed urged by them, to throw sticks and stones at any magpies they happen to see. For on that evening all the magpies are supposed to be far up in the sky among the stars, building there with their wings a bridge so that for a few hours the princess and her lover may be together again.

The princess was the daughter of the sun-god, ruler over the stars and the sky. She was the goddess of weaving, happy all day long as she worked at her loom, weaving into beautiful tapestries the soft pink of the dawn, the brighter colors of noonday, and the glorius reds and yellows of the sunset. One day as she went to the window of her room in the castle tower to look out for a moment at the bright green of the spring landscape, she saw a handsome young man leading the king's oxen down to the river. As she looked down, he looked up. It was spring, you will remember, and they were both young and handsome. It was a case of love at first sight.

When they came to the sun-god to ask his blessing and his permission to marry, he was pleased to give it, for the young man had won his favor by the patient and careful way he had taken care of the royal oxen. Happily then, the princess made her wedding gown out of fabrics woven from dewdrops and colored with the soft light of stars as they are seen reflected in still waters.

The young couple were happy together, so happy indeed that they forgot all about the work they should have been doing. The princess neglected her weaving, and the oxen suffered from lack of care. Finally the sun-god called the princess and her husband before him to tell them how displeased he was at the way they were behaving. They promised faithfully to pay attention to the tasks they had been neglecting.

Alas, love proved stronger than promises, and soon the loom stood idle again and the oxen wandered unattended. Again the king told them how displeased he was and warned them for the second time. Again they promised to improve, and for a few days all went well. Then again love won over duty, and once again the oxen were given no care and nothing was woven on the loom.

Then the king was angry indeed and decreed that the lovers were to be separated forever. He created a great river in the heavens, the Milky Way, so swiftly running and so broad that no boat could cross it and no bridge could be built to span it. On one side of the river he exiled the princess, and on the other, the herdsman. He gave no heed to their frantic pleas nor to their promises of better conduct if given one last, final chance.

The princess then appealed to the magpies, the birds of heaven, and they, in their duty for her, agreed that on one day each year they would come from all over the world to meet above the Milky Way and with their wings make a bridge over it so that the princess could cross and spend a few brief, precious hours with her lover.

That is why any magpie who is seen in Japan and China on July seventh is felt to be neglecting the role he must play that

evening in helping to build the bridge of wings, and so it is that the children of these two countries try with sticks and stones to drive him away to join all the other magpies in building the bridge for their princess.

Lyra, the Lyre, and Aquila, the Eagle, are the two constellations which in China and Japan are supposed to represent the two lovers. When you look for them in the sky, you will see how the faint, pale river of the Milky Way runs between them, separating herdsman and princess on all but one night of the year, the night of the seventh day of the seventh month when the magpies, faithful to that promise made long ago, form their bridge to allow the princess and her husband to meet for an all too short reunion.

ARIES, THE RAM

Aries is neither a very large nor a very important constellation, and it takes a vivid imagination to find in its group of three main stars any resemblance to the animal, the ram, which it is supposed to represent. Yet it is probably the most famous constellation of the twelve which make up the zodiac. Thousands of years ago, before there were such things as the calendars which make it so easy for us to keep track of the progress of the year, watchers of the sky had learned to rely on the stars to provide for them a heavenly calendar that would announce such important events as when spring was about to begin and it was time for farmers to plant their seeds and then, later on, when autumn had arrived and it was time to harvest the crops that had been grown.

From about 2100 B.C. to 100 A.D., it was the stars of Aries as they made their first appearance of the year over the eastern horizon just before sunrise that announced the spring equinox, the day when spring began as the sun crossed the equator on its way north again, and rising due east and setting due west, made day and night equal.

That day was the most important day of the year in the lives of people long ago. For them every winter was a discouraging period of cold and of cruel suffering. The long winter months passed all too slowly. The slanting rays of the winter sun came from low in the southern sky and brought little warmth. The days of winter were short and its nights long. Lacking were the heated homes which allow us to temper the cold of winter. So little was known then of science and astronomy that each year no one was sure that the sun would ever be able to climb back high enough in the sky so that it would recover its lost warmth and allow the earth once more to become warm and fruitful.

No wonder the lengthening hours of sunlight and the increasing warmth of the sun brought joy to their hearts as they realized that spring was about to break the icy bonds of winter and the sun-god was ready once more to smile on the earth. Spring, with its annual rebirth of life, is one of the greatest miracles of nature, and as far back as records go and long before Easter came to mean the resurrection of Christ, the day of the spring equinox was celebrated all over the ancient world with great pagan festivals. Appropriately enough, it was the custom then to start each year by observing that day as New Year's Day. To people who were so dependent upon the weather as were the farmers and shepherds of long ago, it was a far more meaningful time to have the year begin than our rather meaningless first of January.

As they looked forward to the time when they could start planting their fields, it was one of their religious customs to sacrifice a ram to the sun-god, seeking in this way to gain his favor and win his blessing on the seeds they were shortly to sow. It may have been for this reason, or it may have been because the lamb was the first of their animals to be born in the spring, that the ram was selected for the place which marked spring in the zodiac.

Or it may have been that the ram found its place among the stars because of a legendary ram that Jupiter placed in the heavens as its reward for rescuing two children, Helle and Phrixus, who were so hated by their cruel stepmother, Ino, that she was determined to get rid of them. She spread a disease among the crops, and when the harvests threatened to become a failure, she placed the blame on the children. Only by sacrificing them to the gods, she claimed, could the crops be saved. When their father, King Athmus, refused to agree to sacrifice them, she bribed the temple priests to tell him he must agree.

As the children were being led to the altar where they were to be sacrificed, a ram suddenly appeared. He had golden fleece, and he had wings, and he was able to fly. He called out to the children to climb on his back and hold tightly to his fleece, and never look down lest they become dizzy and lose their hold. But over the narrow channel which separates Europe from Asia, Hele forgot his warning, looked down for a moment on the water below, lost her hold and fell to her death, a tragedy commemorated for centuries by the name Hellespont given to that channel. In recent times it has been renamed the Dardanelles.

Phrixus safely reached Colchis and there sacrificed the ram on the altar of Jupiter. The Golden Fleece was fastened to an oak tree in the sacred grove of the war-god Mars and a sleepless dragon was set to guard it. It was to try to get this fleece that Jason assembled his band of fifty Greek heroes, the Argonauts, and set out with them on the ship Argo, a quest which he successfully accomplished after many heroic adventures and after the powerful enchantress Medea, daughter of the king of Colchis, had fallen in love with him and had come to his aid with all her great powers of magic. You will find that story told under Argo Navis. This is not told in this booklet, but you can look it up as an outside research project.

AURIGA, THE CHARIOTEER

This very ancient constellation honors Erichthonius, a crippled king of Athens, who, because he could not walk, invented the chariot and thus earned a place in the celestial hall of fame.

> His art great Jove admired, when first he drove
> His rattling Car, and so placed the Youth above.

In the pictures which show what Auriga is supposed to represent, no chariot is ever found, but grasped in the Charioteer's right hand are the reins which a driver of a chariot would be holding. Strangely enough, however, for the driver of a chariot whose spirited steeds would seem to need all his attention and strength, the Charioteer is also shown to be holding a goat over his left shoulder and two little kids in his left hand. Thus these pictures tell a mixed-up story, suggesting both a chariot driver and a goatherd.

Capella, the bright star in Auriga, represents the goat on the driver's shoulder, and three faint, fourth magnitude stars which form a triangle close to Capella represent the Kids. Capella is the most northerly of the fifteen first-magnitude stars visible from the Northern Hemisphere and from the United States is visible at some time during every clear night of the year.

The rising of Capella in early evening was a welcome sign for shepherds in olden times, for it foretold the coming of the rainy season upon which they relied for the renewed growth of the pasture lands upon which depended the welfare of their flocks.

On the other hand, its appearance then was a most unwelcome sign for sailors, for when it appeared with the Kids it signaled the beginning of the stormy season when navigation on the Mediterranean became impossible for the crude ships of ancient times. As early as 240 B.C. we find a poet writing.

> Tempt not the winds forewarned of dangers nigh
> When the Kids glitter in the evening sky.

The Kids were regarded as "horrid, mad stars" by the wives of sailors who are shown in old pictures with hands clasped in prayer as, terror-stricken for the fate of their husbands, they watch the waves leap high and the winds swirl around in mighty gusts under the stormy influence of the Kids.

Not until Capella and the Kids finally disappeared below the western horizon months later was it safe again for ships to venture out from port. Then all along the Mediterranean seacoasts,

the ancient seafaring towns celebrated with a festival known as Natalis Navigationis, a title which can be roughly translated as the Birthday of the Renewal of Shipping.

In Arabia, Capella was known as Al Pakib, the Driver, so named because it appeared in early evening shortly after the appearance in autumn of the Pleiades which Arab shepherds thought of as a flock of sheep being driven across the sky by Capella.

The rider in the chariot of Auriga is sometimes identified as Neptune, the god of the sea, who rode around in a chariot by sea horses whenever he ventured on land. In sculptured figures which decorate many ancient Roman fountains, he is frequently shown standing in a chariot, his trident held in one hand, and in the other, the reins by which he guides his strange steeds.

There is a certain appropriateness in this identification, since it places Neptune in the heavens close to those constellations which are linked together in the story of how Neptune sent the fearful sea monster Cetus to ravage the seacoast of Queen Cassiopeia's kingdom in punishment for her boasts that she was more beautiful than any of the maidens of the sea-god's court.

BOOTES, THE BEAR DRIVER

Bootes is usually pictured as a tall man who is grasping a spear in his right hand, and in his uplifted left hand is holding a leash attached to the two hunting dogs Canes Venatici. As is the case with many of the constellations, several different stories are told about Bootes to explain what its stars are supposed to represent.

One story is that Bootes was put in the heavens to keep watch over the Big Bear and make certain that it kept ever in its proper place, endlessly circling around the North Star. The hunting dogs were not added until the seventeenth century, when the astronomer Jan Hevelius decided that Bootes ought to have some dogs to help him in his task of guarding the Bear and used some faint stars that had not been included in other constellations to create the constellation of Canes Venatici.

A second story identifies Bootes as a young man whose brother robbed him of all that he was supposed to inherit. To support himself as a farmer, he invented the plough and thus became one of the greatest benefactors of mankind. So pleased with this invention was Ceres, the goddess of growing things, that she asked Jupiter to honor Bootes by placing him, his plough, and his oxen close together in the sky. The heavenly plough is a familiar figure to English stargazers, who know the Big Dipper stars as the plough stars and picture the four stars of the Dipper Bowl as the Plough proper and the three handle stars as the oxen who are pulling it.

In still a third story, Bootes is supposed to have been Icarius, the rich owner of an immense acreage of vineyards in Attica. He once took the god Bacchus on a tour of the vineyards, and Bacchus was so pleased by the hospitality shown him that he taught Icarius how to make wine from his grapes. To celebrate his first successful attempt to make wine, Icarius invited all his friends to a party where they could taste the heavenly liquor he had learned to make. At the party they all drank too freely, became intoxicated, and finally fell asleep.

When they woke up, they decided that Icarius had tried to poison them, and they punished him by killing him and throwing his body into a ditch. Asterion and Chara, Bootes two dogs which are the main stars in the constellation of Canes Venatici, missed their master and began to whine and pace around restlessly in such a way that it was clear to Bootes' daughter, Erigone, that something had greatly disturbed them. She unleashed the dogs, and they soon found their master's body. Beset by grief, Erigone killed herself, while the dogs leaped into the ditch to lie down there and die close to their beloved master.

This whole tragic story is pictured out in the sky. The constellation of Virgo represents Erifone. As Virgo rises, the hunting dogs follow and the search for Bootes begins. Not until Bootes has moved across into the southern sky do they find him, and then, as Bootes, Canes Venatici, and Virgo sink in the west, the end of the story is reached and all die.

Long ago, at some time or other, the handle of the Big Dipper was so badly bent in its middle that a line drawn to connect its three stars would have to be a curved line through the sky, you will find that it leads to a red-gold star, Arcturus, one of the most beautiful as well as one of the brightest stars of the heavens.

> Below his girdle, near his knees, Bootes bears
> The bright Arcturus, fairest of the stars.

Look for the Big Dipper between eight and nine on an evening in mid-March and you will find the Dipper bowl then to the right of the North Star and high above it, while the handle stars have swung around so far to the right that they are pointing down to where Arcturus is just rising low above the horizon in the northeast. The reappearance of Arcturus at that time of year is a surer sign that spring has arrived than any glimpse of a robin hopping across a lawn. Indeed, now that there are winter feeding stations in many backyards, a robin often finds it easier to depend on a daily handout up north than to spend his energy on a long flight south.

On the other hand, nothing ever stops the stars from making their appointed rounds and so they can always be depended upon to reappear according to an unvarying schedule. So when Arcturus makes its first appearance over the northeast horizon at about eight o'clock on a mid-March evening, the star is a sort of astronomical robin which can be relied upon as an infallible sign that the earth has once more arrived at the spring equinox, the first of the four great milestones in its annual journey around the sun.

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CANCER, THE CRAB

Cancer is a very faint constellation, but it is one of the most important among the twelve constellations of the zodiac. The ancient astronomers who first identified the constellations in front of which the sun passes in the yearly journey which it seems to be making around the earth came to realize that the sun did not rise morning after morning over the same point on the eastern horizon. From long observation they had learned that in midwinter it rose in the southeast, but that on each succeeding morning it rose slightly farther east, until on the morning of the spring equinox, it rose directly east, and on the morning of the summer solstice, well to the northeast. Then, having reached as far north as it was to go, it stopped and slowly began to move again toward the east and the southeast.

Naturally enough, the constellation in front of whose stars the sun was located at the time it reversed its course, and after having shuttled one way, now began to sidle back in the other, was named after the crab, the only creature these ancient people knew which could crawl sidewise first in one direction and then in the other. The Tropic of Cancer, the imaginary line that circles the earth 23½ degrees above the equator, is so named because thousands of years ago the sun at the summer solstice was directly above that great circle.

Cancer is also identified as the giant crab which Juno sent to annoy and distract Hercules as he fought his desperate battle with the many-headed Hydra, the Water Snake. Hercules was the son of one of the many mortal women whom Jupiter married, each time arousing the jealous anger of his goddess wife, Juno. Juno took a special dislike to Hercules and tried in many ways to make life miserable for him. Hercules easily crushed the crab with one stamp of his foot, but Juno, who realized the creature had done its best in trying to serve her, rewarded it by placing it as a constellation in the sky.

Still another old myth tells of an experience Bacchus, the god of wine, had while on his way to the temple of Jupiter. He found his way blocked by a stretch of wet marshland and wondered how he would be able to cross it without getting his feet wet. Two jackasses were grazing nearby, and one of them agreed to carry him across. In gratitude, Bacchus changed the jackasses into stars and placed them in the sky close to a heavenly manger where a never-failing supply of food gives them the chance to feed forever and ever. Ascellus Borealis, the Northern Jackass, and Ascellus Australis, the Southern Jackass, are the two stars close to the famous star cluster in Cancer, the Beehive, which according to this myth is the manger at which they are supposed to be feeding.

The Beehive, or Praesepe as it is also known, can be seen with the naked eye on a dark, moonless night as a hazy spot in Cancer. In binoculars it is revealed to be a group of 40 or more faint stars that look like bees buzzing around their hive, hence the name Beehive. In ancient times it was a famous weather sign.

Only when the atmosphere is perfectly transparent can the Beehive be clearly seen. Its stars are so faint that they are hidden from sight whenever the slightest veil of cirrus clouds warns of the approach of a coming storm.

CANIS MAJOR, THE BIG DOG

Canis Major is the largest and the fiercest of the two hunting dogs that had been Orion's faithful companions on earth and were placed at his feet in the sky so that this greatest hunter of olden times might continue to have their help as he chased Taurus, the Bull, across the great reaches of the heavens.

In the numerous bright stars of this constellation, it takes only a little imagination to trace the outline of a dog standing below Orion, head up and tail down, his bright eye, the star Sirius, intent on his master's face as he waits alert to spring into action when the hunter needs him.

Canis Major is also sometimes identified as the famous hound-dog Laelaps, who once he started trailing the scent left by an animal never gave up until he had overtaken his quarry. He was one of two unusual wedding presents given to Cephalus, a grandson of Aeolus, the King of the Winds, when he married a beautiful girl by the name of Procris. The other gift was a javelin, a long spear which once hurled at a target never failed to hit it.

Cephalus persuaded his wife to let him take the dog and the javelin on a hunting trip. After he had been gone for several days, Procris became lonely for him and decided to make a surprise visit to his camp, Laelaps heard her and growled a warning to Cephalus, who listened and thought the rustling noises that Procris was making as she crept toward him were being made by a wild animal. Out into the dark in the direction from which the noises were coming he threw the javelin that never missed and it hit and killed Procris.

Although Laelaps had done nothing more than give the warning that any alert watch dog would have done, he was punished, most unjustly it would seem, by being placed in the sky close to Orion and doomed to chase Lepus, the Hare, forever and ever through the skies.

From two just such opposite viewpoints, long ago the people of Egypt and of Rome regarded Sirius, the star which is the chief ornament of Canis Major. By the Egyptians, it was so highly honored that great temples were erected where the star could be worshipped, whereas among the Romans, Sirius stirred up only feelings of fear and hatred. So opposite were their points of view about the same star that one ancient nation almost seemed to be saying to the other, "You're upside down."

In Egypt, the great temples sacred to Sirius were so oriented that on the mid-July morning when that star was seen rising in the east just before sunrise, its low rays would shine into the very center of the temple and light up for a moment of great significance, because long experience had taught the Egyptians that this first, just-before-sunrise appearance of Sirius could be depended upon to occur far enough in advance of the annual Nile flood to give ample warning that the time had come to move possessions up from the low river valley to higher ground. There the Egyptians could watch in safety, knowing that the new soil which would be deposited on their fields by the flood would renew the fertility of their farm lands. No wonder they were ready to worship as one of their most honored deities the star which gave both the timely warning of the flood danger and the promise of the fruitful season which would begin as soon as the flood subsided.

On that same mid-July morning, the people of Rome would have watched Sirius rise with anything but pleasant anticipation. They knew that for days to come Sirius and the sun would journey across the sky as close companions. They believed that when the light of this brightest of the stars was added to the hot rays of the summer sun, the combination was responsible for the hot and sultry weather of the dog days which brought great discomfort to man, made dogs turn mad and burned up crops. So, instead of worshipping Sirius as a kindly god as the Egyptians did, the Roman people regarded him as an angry and hostile deity to whom sacrifices must be made in the hope of winning his favor and averting his hatred. To them Sirius was the star

> whose burning breath
> Taints the red air with fevers, plagues, and death.

Because Sirius is the brightest of the stars and is visible from every inhabited part of the earth, all through the ages it has been almost everywhere an object of admiration and worship.

Teacher Center

CANIS MINOR, THE LITTLE DOG

Canis Minor is the second of the favorite hunting dogs of Orion that were placed in the sky to keep him company there. Unlike the wild and fierce dog of Canis Major, Canis Minor is usually pictured as a friendly animal, more nearly the sort of dog that would be a house pet.

The constellation has only two main stars that are bright enough to be easily found, but one of them, Procyon, ranks among the brightest stars of the heavens, and its brightness is made more conspicuous by its shining all alone, with no other bright stars as close neighbors.

Procyon, whose name means "before the dog," can be depended on to rise in the east about half an hour before Canis Major is due to appear, and this like a faithful watch-dog gives warning to stargazers that Sirius is just below the horizon and about to appear very shortly.

In a myth told about the goddess Diana, Procyon is the dog who killed his beloved master, Achtaeon, under most tragic circumstances. While out hunting, Achtaeon surprised Diana bathing in the nude in a fountain in a secluded forest glade. Swift to punish the young man who had thus shamed her by seeing her unclothed, Diana turned him into a stag, saying "Now, go and tell what you have seen, if you can." Out of his head grew a pair of branching horns, his neck grew longer, his ears became sharp-pointed, his hands became feet, and his body was covered with hairy hide. Suddenly he heard the baying of a hound and realized it would be but a moment before it reached him. Off he fled and hot on his trail the hound followed, gaining all the while. Achtaeon saw that it was his own favorite hound that was in pursuit, and again and again he called to him hoping, but to no avail, that he would recognize his master's voice. Finally Achtaeon fell exhausted, and the hound sprang upon his body and tore it to pieces.

CAPRICORNUS, THE SEA GOAT

Next to Cancer, Capricornus is the most inconspicuous constellation of the zodiac. Its stars, most of them faint ones, outline an odd-shaped figure much like an upside-down cocked hat of the sort that children learn to make of newspapers when they want to play soldier.

Up in its upper right-hand corner, however, it does have two fairly bright stars that are of special interest because each is a double star. Giedi, the upper one, is a naked-eye double for a stargazer with good eyesight, but to see Dahib, just below, as a double requires using binoculars.

As winter drew nearer and day by day the sun sank lower in the noon sky, the people of ancient times watched with fear and apprehension. Would the sun keep sinking until it disappeared and was lost forever? In the past, it was true, it had never failed to start climbing back again, but there was nothing in their scant knowledge of science and astronomy to give them any assurance that this was an annual phenomenon which could be relied upon to repeat itself year after year.

Then came the happy day of the winter solstice when it became apparent that the sun had stopped dropping and was not going to be lost. As it began to climb higher and higher day by day, all over the ancient world there were great rejoicing and great celebrations of thanksgiving. Typical of these was the Roman holiday of Natalis Solis Invicti, the Birthday of the Unconquered Sun, the pagan holiday that was celebrated on December 25 for many centuries before it was chosen by the Christian world as the date for the celebration of Christmas.

Appropriately, the figure of a goat, the animal most famous for his climbing ability, was chosen to represent the constellation of the zodiac in which the sun was found at the time it began to climb back higher in the sky. As pictured in the old star atlases, however, this goat of the heavens is not a typical goat of the fields and mountains, but a sea goat, a strange, fabulous creature with the head and body of a goat but with the tail of a fish. Half goat and half fish, Capricornus thus became a creature not only able to climb but also one that would be at home in the rains and floods of the winter season.

Two stories told about Pan, the god of fields, and flocks offer interesting explanations for this queer, jumbled-up figure with its goat head and fish tail. One tells of a day when Pan, who was a mischievous imp who dearly loved to play the clown, joined a group of river nymphs and to amuse them jumped into the

river and instantly turned the part of his body which sank below the water into a fish while the part still above water remained the head of a goat. Jupiter, who happened to be passing by, was so amused by Pan's cleverness and his odd appearance that he decided to put the half-goat, half-fish into the sky as a constellation.

In the second story, Pan is pictured as playing his pipes to entertain the nymphs when he was surprised by the terrible monster, Typhon, which had a hundred dragon heads and eyes from which flames shot forth like fiery blasts from a raging volcano. There was no time to think, only to act, and quick as a flash, Pan dove into the river, changing into a fish as he hit the water. But everything happened so fast that only the rear part of his body changed, and so he wound up with a fishtail but still retaining the horns and the bearded head of a billy goat.

Long ago in Peru, the year began at the winter solstice with the observance of their most important yearly festival, the Festival of the Beard. It was so named because they called the constellation in front of which the sun was then passing not Capricornus, but Nicca, the Beard. Those who took part in the festival ceremonies wore masks with long beards, and the beard is, of course, one of the main features of a goat.

As the constellation in which the sun was located at the time of the winter solstice, Capricornus was always associated in olden times with the cold and the storms of that time of year.

CASSIOPEIA, THE QUEEN

Of all the women for whom places have been found in the heavens as constellations, only Cassiopeia was put there to be punished rather than to be honored. For half of every night as she swings around the North Star, she is upside down in the chair in which she is seated, hanging on for dear life in a position which must be a most humiliating one for this queen of old who was so proud of her beauty.

To tell why she is being punished in this way requires a long story in which a sea serpent and a winged horse, as well as her husband Cepheus, her daughter Andromeda, and the Greek hero Perseus all play parts which have earned for them places as starry constellations close to the chair in which Cassiopeia circles the North Star.

It is a story best told in two parts. You will find the first part here, but for the second part you must turn to the story of Perseus.

Cassiopeia was truly a very beautiful woman but so proud of her beauty that she was fond of boasting about it. One day the maidens who attended King Neptune in his kingdom under the sea learned that she had made a boast that she was far more beautiful than any of them. They demanded that Neptune do something to punish her for that boast.

Neptune responded by sending a monster sea serpent, Cetus, to terrify those who lived along the coast of the country ruled by King Cepheus and Queen Cassiopeia. As Cetus swam along the coast, he surprised and devoured fishermen whom he encountered as they were mending their nets. He snatched away children found playing along the sands and carried off women who had come down to the shore to wash clothes. Before long, the people were as terrified as we are today when sharks are reported to be hovering off the beaches where we go to spend summer days.

In those days, when people wanted to find answers to great problems that were troubling them, they went to temples where women known as oracles could be appealed to for advice on what should be done. So King Cepheus went to an oracle to find out how to get rid of this horrible monster that was causing so much trouble. The oracle's answer was that only if he sacrificed his daughter, Andromeda, to the serpent would the maidens feel they had been avenged for the way Cassiopeia had insulted them and ask Neptune to recall the serpent.

To have to sacrifice their daughter in such a terrible way was something which the king and the queen resisted as long as possible, but finally they had to give in to the demands of their terrified subjects. So with iron chains around her feet and her arms, Andromeda was bound to a rocky island a little distance off shore, and on the beach a great crowd of people gathered to watch for the coming of the sea monster.

CEPHEUS, THE KING

Cepheus is one of five constellations that form the so-called Royal Family, which includes his wife, Queen Cassiopeia; his daughter, Andromeda; Cetus, the Sea Monster who was sent by Neptune to devour Andromeda; Perseus, the hero who rescued her; and Pegasus, the Winged Horse which Perseus rode through the sky as he returned from his successful quest to bring back the head of Medusa. So tied together are these constellations in the way they fit into the story of Andromeda's rescue that it seems clear they were grouped together in the sky not by chance but by design by some ancient stargazer who intended them to be eternal reminders in the heavens of a legend that is one of the best-known hero stories of all time.

Outlined by five not very bright stars arranged in a way to suggest a church with a spire on top, Cepheus is a rather faint and inconspicuous constellation, perhaps fittingly so because in his household, King Cepheus always played second fiddle to his wife, who ruled the roost. In the Andromeda-Perseus story she plays a major role, while he has only a very minor role.

CETUS, THE SEA MONSTER OR THE WHALE

Cetus is the fabled sea monster that was sent by Neptune to devour Andromeda and thus punish Queen Cassiopeia for boasting that she was more beautiful than the maidens of Neptune's underwater kingdom. The head of Cetus is outlined in the skies by five stars which form an almost perfect equilateral pentagon. The rest of its body is marked by a long, rambling line of stars arranged in such a way that the constellation is shaped so much like a reclining chair that it is often called the Easy Chair.

Although sometimes referred to as the Whale, Cetus is never pictured as a whale but as a creature so odd that no one has ever seen its equal. It has the forked tail of a dolphin, the paws of an animal, the head of a greyhound with short tusks coming out of it, and a very long, scaly neck. The people of ancient times who gave this constellation its name had probably never seen a whale, but they may have heard tales of strange monsters that were found far north in the ocean and created Cetus as they imagined a creature must look who lived far down in the ocean depths.

The ugly creature who clambered up over the rocks to make his way to where Andromeda was chained has been described as covered with barnacles and festooned with seaweed, a long sinuous creature who may possibly have been one of the last surviving specimens of the early age in the earth's history when the seas were full of reptiles of great size that often emerged from the watery depths to overrun the land in search of their prey.

Some idea of how large Cetus was supposed to be was given by the Roman writer Pliny, who lived in the first century A.D.. According to him, the skeleton of Cetus was brought back and exhibited in Rome. It measured forty feet in length and had ribs six feet long.

The natives of Ethiopia in Africa, however, are fond of pointing out to credulous tourists a long promontory which stretches out from a rocky island where Andromeda was chained, and the promontory marks the body of Cetus, turned into stone as he looked up to where Perseus had pulled from his pouch the head of Medusa, one look at which was guaranteed to turn man or beast into a stony statue.

CORVUS, THE CROW

You can believe it or not, as you please, but the old stories say that long ago the crow, or raven as he is sometimes called, did indeed have silver-white feathers and a beautiful singing voice as well. What caused the change to the inky-black bird we know today, his voice limited to a hoarse croak, is explained in two Greek myths which are alike on only one respect, namely that they say the crow was once the trusted messenger of the god Apollo.

One morning, as the first story tells the tale, the crow was sent to a spring to fetch a cup of water for Apollo. At the spring he was so tempted by the delicious promise of some half-ripened figs on a tree growing close by that he dallied there for a long time while waiting for them to ripen. He had quite a feast, but when he was ready to start back he realized he was due for a scolding for having taken so long. So he carried back a water snake in his claws and told Apollo the snake had tried to keep him from filling the cup. Apollo could easily tell that the crow was lying, and so he angrily punished him first by changing the color of his feathers to black and then by condemning him to be known in the future for his croak instead of for his song. Then, as an added punishment to last forever, he placed the crow in the stars close to the constellation of Crater, the Cup, and ordered Hydra, the Water Snake, never to allow the Crow to get close enough to the Cup to be able to drink from it. So, there in the heavens is the Crow, forever tormented by seeing the cup of water which is so near him but which is always kept just out of his reach.

The second story pictures the Crow as having been sent on a much different errand, this time to spy on the maiden, Coronis, with whom Apollo was in love but who he suspected was being unfaithful to him. The Crow reported back that Apollo's suspicions were well founded, but he kept talking about how the maiden was carrying on behind Apollo's back. Finally Apollo could stand it no longer, and he exploded with a burst of anger which Ovid, a Roman poet who lived about the time of Christ, described in these words:

> Then he turned upon the Raven
> Wanton Babbler! see thy fate!
> Messenger of mine no longer,
> Go to Hades with the prate.
>
> Weary Pluto with thy tattle!
> Hither, monster, come not back;
> And to match thy disposition
> Henceforth, be thy plumage black!

CYGNUS, THE SWAN

Anyone who has seen a swan in flight with long, outstretched neck, widely spread wings, and typically short tail will readily see that it does not put too much strain on one's imagination to see outlined by the stars of this constellation the figure of a swan flying through the sky. Even more clearly outlined is the figure of a cross, and today it is as the Northern Cross that this constellation is perhaps better known.

Early in the evening at Christmas time, the Cross will be found standing upright in the northwest as though set high up on the top of a great cathedral. Seen at that time in that position, it provided a beautiful and timely symbol of the Christian faith.

Why a swan was granted a place long ago among the constellations is explained by the story of Phaeton and his disastrous attempt to drive the sun chariot across the sky.

"My father is Apollo, the sun-god, and some day he is going to let me drive his chariot across the sky," the boy Phaeton boasted to his playmates one afternoon. They laughed and jeered at him. "You don't have any father!" they shouted, for they all knew that his mother was a widow, and the idea that her husband had been a god was altogether too farfetched a tale to be believed.

"I'll prove it! You wait and see," and Phaeton ran home weeping to ask his mother if it was really true that Apollo was his father.

"Yes, it's true," she said.

"Then why doesn't he ever come to see us?"

"He is much too busy," his mother answered, "but you have now grown up enough to make the long trip to his palace in the east and find out for yourself whether or not he will welcome you as his son."

So Phaeton set off on the long journey to the eastern land where the sun rose. Days and days later he finally reached the gorgeous palace of Apollo, its great columns glittering with gold and precious gems. It had silver floors and ivory ceilings, and in its central room sat Apollo, robed in a purple gown on a throne all aglitter with diamonds.

"I know you, Phaeton, my son," Apollo greeted the youth. "Why have you come here so far from your mother and your home?"

"To get proof that you are indeed my father," said Phaeton, "so that when I tell my playmates whose son I am they will be ready to believe me and not mock and jeer at me."

"To put an end to your doubts," said Apollo, "ask me for anything you want and I swear to you by the sacred word of a god that I will grant your request."

Little did he realize what that request would be, for Phaeton, mindful of the boast that he had made, asked to be allowed to drive the sun chariot for a day across the sky. Apollo did everything he could to try to persuade his son to make some other request.

"You cannot possibly manage those four spirited steeds," he said. "Even I as a god have all I can do to keep them under control. I know I gave you my solemn promise, but I beg you to release me from it and ask something else."

But Phaeton was determined that he was going to drive the chariot, and nothing that his father said could persuade him to change his mind. Apollo found himself forced to keep his promise, for the word of a god once given can never be changed. Reluctantly and with many misgivings he agreed to let Phaeton drive the chariot the next day.

So Phaeton and Apollo were waiting at the gates of morning as Aurora, goddess of the dawn, opened them wide and the grooms from the stables of the sun-god led down the four horses harnessed to the chariot which Vulcan, blacksmith of the gods, had created for Apollo. It had a golden axle, its wheels of gold with silver spokes, and all along the driver's seat were rows of diamonds.

"Hold the reins tight, my son," Apollo warned. "Never use the whip and don't climb too high nor let drop so low that you will set the world afire." Impatiently the fiery horses pawed the ground, and then they were off with a rush. They soon realized that the reins were not in their master's hands that day, but in the hands of a weak and unskilled driver, and so they rushed headlong, unguided and uncontrolled. They dropped down so close to the earth that the forests on the mountaintops began to blaze, the seas and the oceans turned into deserts, and all growing crops were destroyed.

Desperately Phaeton urged the horses higher, and they soared upward so high that they left the great scorched pathway across the sky that we know as the Milky Way. Neptune, the god of the sea, roared his anger as he watched his oceans become boiling hot, and Jupiter realized the world would be destroyed if he did not act quickly. He shot one of his lightning bolts at the hapless Phaeton, who was killed instantly and with hair afire fell like a shooting star into the river Eridanus.

In those days it was believed that the soul of a dead person must roam the world forever as a ghost unless his body was properly buried. Cygnus, Phaeton's best friend, dove again and again into the river to try to recover the body. Jupiter was so moved by the love and devotion that Cygnus was showing for Phaeton that he turned Cygnus into a swan so that he might be able to dive more easily. Finally, after Cygnus gave up in despair of ever finding the body, Jupiter placed him in the heavens as a swan.

DRACO, THE DRAGON

Of the two well-known stories about the Dragon, one dates back to the time before Jupiter came into power on Mount Olympus and when he and his group of younger gods were waging a furious battle against the old gods, the Titans and the Giants, who had long been the rulers of the world. Near the end of that battle and after it had gone on for eight years, the Dragon, who was fighting on the side of the Titans, attacked Minerva, the goddess of Wisdom. Minerva seized him and hurled him so far and so high that he landed all coiled up at the top of the sky close to the North Pole of the heavens. There, where it is always icy-cold, he froze into place before he could uncoil, and there, as the sky turns counterclockwise, his long twisted body turns with it, his snaky coils entangle between the Big Bear and the Little Bear.

In the second story, Draco is the dragon set by Juno to guard the golden apples of the Hesperides in the garden of the west after she had given them to Jupiter as her wedding present to him. This dragon was a monster whose fiery breath was deadly poison and whose enchanted hide no arrow could pierce. Eternally awake and ever watchful, he coiled around the tree on which the golden apples hung and would allow no one to come close except the giant Atlas, who stood nearby holding up the world on his shoulders.

To get the apples away from this dragon was one of the twelve labors which Hercules had to accomplish. He came to Atlas for help, and Atlas agreed to get the apples for him if in the meantime Hercules would take over the task of holding up the world. But when he came back with the apples, Atlas had enjoyed his freedom so much that he decided to run away with the apples and leave Hercules behind still supporting the earth.

Hercules was clever enough to know that giants are often as stupid as they are big and strong, and so he asked Atlas to relieve him of his burden just long enough so that he could put a pad under his shoulders to ease the weight of the world. Atlas fell for the trick, and then Hercules snatched the apples and ran off leaving the poor giant bending under the weight of the world just as he had been when Hercules had found him.

To punish the dragon for its failure to guard the golden apples safely, Juno placed it as one of the circumpolar constellations where in the northern heaven it would never set and would always remain on guard.

Some 5,000 years ago, the fourth-magnitude star Thuban in its location close to the end of Draco's tail was the Pole Star,

the fixed point in the sky around which the entire northern heavens would then have seemed to revolve just as now they appear to revolve around the North Star, Polaris. This change over the years in the Pole Star has occurred because the earth is wobbling in the same way that a slowing-down top wobbles, and so the earth's axis does not continue to point toward the same spot in the northern sky but slowly traces out a circle among the stars there. It is a change much too slight to be noted during the lifetime of any person. Only after thousands of years does it become apparent that a new North Star had taken the place of the one toward which the earth's axis had been pointing.

Only in the last 2,000 years had Polaris come close enough to celestial north to be the North Star. It is now about a degree away from true north, and in the 25,800 years which it takes for the earth to complete one of its wobbles, various stars will in turn become the North Star, notably Deneb in 10,000 A.D. and Vega in 14,000 A.D.. About 23,000 A.D. it will be Thuban's turn again and the cycle will start all over.

When the Great Pyramid at Cheops was erected, about 3,000 B.C., Thuban was the North Star. Hollowed out of stone of that Pyramid is a tube which leads down 380 feet to a room in the center of the Pyramid. That tube was so oriented that it pointed directly up at Thuban in its fixed position as the North Star of that period. All night long, every clear night of the year, the light from Thuban shone down the tube to light up the jeweled eye of an idol seated at an altar in that inner room. No longer, however, do Thuban's rays penetrate in that way, for the earth's wobble has caused the tube to move out of that star's line of sight. Only if the Pyramid endures for some 21,000 years to come will the light from Thuban be visible again in the tube all through the night.

GEMINI, THE TWINS

The conspicuous features of this constellation are two bright stars so nearly alike in brightness and so close together - only 4½ degrees apart as distances are measured in the sky - that in the myths of every ancient land they seem to have been regarded as twin stars, representing twin heroes about whom great adventure stories were told.

To the Greeks they were Castor and Pollux, twin brothers who were so devoted to each other as to be inseparable companions. Pollux, like his father, Jupiter, was immortal, but Castor, like his mother, Leda, was mortal. When Castor was killed in battle, Pollux could not be consoled, and rather than be separated from his brother, he begged Jupiter to take away his immortality and allow him to die so that he could join Castor in the afterworld. So impressed was Jupiter by this demonstration of the great love which the brothers had for each other that he worked out an interesting compromise, decreeing that if Pollux would spend half of each day with Castor in Hades, Castor would be permitted to spend the other half with Pollux on Mount Olympus among the gods.

Eventually Jupiter decided to honor the brothers by changing them into stars and placing them in the heavens to be an eternal memorial there of brotherly love at its finest. They were placed at the head of the constellation of Gemini whose pattern of stars outlines two toothpick-like figures standing with their arms around each other.

The twins were among the heroes who went with Jason on the ship Argo in the historic voyage in quest of the Golden Fleece. During the voyage the monstrous waves of a great storm threatened to sink the ship, but suddenly two strange lights that looked like flames of fire appeared over the heads of Castor and Pollux, and the storm ceased as suddenly as it had begun. These lights, known as St. Elmo's fire, are often seen playing over the masts of a ship during a storm, and ever since the time they appeared above the heads of the Twins on the Argo they have been considered by sailors to be signs of good luck.

After their return from the quest of the Golden Fleece, the Twins waged war against the pirates who infested the Hellespont and had such success that they were hailed as the "Sailor's stars." Many a Roman ship sailed the Mediterranean long ago with its bow decorated by a figurehead carved to represent Castor and Pollux, a figurehead supposed to bring good luck to the vessel.

To the Roman people, Castor and Pollux became special heroes because of a tradition that they had often appeared to lead Roman armies on to victory when Rome was being threatened by enemy armies.

If you ever pay a visit to the ancient Roman Forum in Rome, your guide will undoubtedly point out to you the three tall columns which still stand to mark the place where long ago a great temple was raised to honor the Twins. The story of why they were so honored begins on a day when outside the gates of Rome a great enemy army was encamped, bent on conquering, that ancient and proud city. Every Roman soldier and every Roman Citizen able to bear arms had been called together in readiness to march out of the city for the battle on which rested the fate of Rome.

Suddenly, at the head of that army, two knights appeared, clad in white armor and mounted on white horses.

No one knew who they were, and when asked, they replied, as the English poet Macaulay tells the story,

> By many names men call us,
> In many lands we dwell,
> And for the right we have come to fight
> Before the ranks of Rome.

In the battle, they fought with such skill and courage that the Roman army was inspired by their leadership and went on to rout the enemy host and win a great victory.

The two horsemen Castor and Pollux - Gemini, the Twins, as the Romans later came to know them - led the victorious army back into Rome to receive there a welcome much like the ticker-tape shower with which our national heroes are greeted as they ride through the streets of New York City.

There in the Forum, center of life in the ancient city of Rome, they stopped to let their horses drink from a spring which bubbled up close to the temple of Vesta. There where they stopped Rome raised a great temple in their honor, a temple to which the Romans came to swear solemn oaths "By the Gemini," an echo of which old oath is found in our modern "By Jiminy."

The Twins were honored in Rome in yet another way, for, dating back as far as 431 B.C., they appeared on Roman coins as two horsemen riding at full speed as if charging into battle. Their figures were shown in this way on the twopence which the good Samaritan left with the host of the inn to take care of the stranger whom he had found lying wounded by the roadside.

HERCULES, THE KNEELER

As usually pictured, this constellation shows the figure of a giant head down in the sky, kneeling on his right knee with his left foot planted on the head of Draco, the Dragon. Up above his head, the giant is brandishing an enormous club while in the other hand he grasps a branch of wood, or as sometimes represented, the three heads of Cerebus, the dog that guarded the gates of Hades.

The constellation, one of the oldest of the star groups, was not originally known as Hercules. Who or what it was supposed to represent by those who first laid it out is very much a mystery. For a long time it was known simply as the Kneeler, and it is in this way that Aratus refers to it in his poem.

> The Kneeler is the name he's called,
> He is crouched on bended knee;
> And both his arms are upward raised;
> The toe of his left foot is placed
> Upon the Dragon's head.

It is clear, therefore, that it must have been after Aratus's time that Greek astronomers decided to name the constellation Hercules as a memorial to a legendary Greek hero who spent his life fighting and conquering dragons and monsters of all kinds and doing epic deeds which only he, the strongest man of the ancient world, could ever have done. Nothing that lived in the air, in the sea, or on the land ever defeated him, and it was only by magic that he was finally killed.

Hercules was the son of the immortal god Jupiter and a mortal woman, whom Jupiter had married just as he had married a number of others, in each case making Juno, the goddess wife of Jupiter, so jealous when she learned of another woman who had captured his fancy that she was determined to try to punish someone, usually the unfortunate woman. This time, however, she decided to vent her spite on Hercules and do everything she could to make his life difficult and miserable. While he was still a baby in his cradle, she sent two enormous snakes to kill him, but Hercules, showing even then the prodigious strength for which he was to become famous, strangled both of them with his bare hands.

When he had grown to manhood and had a wife and children, Juno caused him to become insane for a brief period during which he murdered all his family. To atone for that dreadful deed, he was bound out as a slave and was to earn his freedom only by successfully accomplishing twelve heroic tasks, the so-called labors of Hercules, each one of which was to be a cruel and punishing test of his courage and his strength.

He started off by killing the Nemean lion, the largest and most powerful lion ever known. Look for that story under Leo, the Lion. Next came his battle with Hydra. From these two battles he got his famous shield, made from the lion's skin which no arrow could pierce, and his great club, made from an olive tree which he had uprooted to use in his fight with Hydra. He dipped all his arrows in Hydra's poisonous blood and this made them so deadly that the slightest scratch from one of them was sure to cause death.

His third labor called for the capture of the wild boar that was ruining the vineyards of Arcadia; his fourth, for the capture of a deer whose horns were of gold and its hoofs of brass; his fifth, to shoot a flock of man-eating birds, monsters with beaks of brass and feathers which they could shoot like arrows.

His sixth labor is one of the most famous. In a single day he had to clean out the stables where 3,000 cattle had been confined without having any of their accumulated filth cleaned out for years. This task he accomplished by diverting two rivers from their course so that they would flow through the stables and thus give them a thorough cleaning.

Then followed the seventh labor, the capture of the Cretan bull that snorted forth great scorching flames, and the eighth labor, the killing of the horses of King Dionedes that protected his kingdom by eating alive any stranger who landed on its shores.

Ninth among his tasks was to get the jeweled belt of the Queen of the Amazons. His tenth called for the capture of a herd of oxen guarded by a giant with three heads, six hands, and three bodies. To complete these first ten labors took him eight years and a month.

His eleventh labor, and probably one of the most difficult of all, was to go down to Hades and bring back Cerebus, the fierce three-headed dog that guarded the gates of King Pluto's kingdom. Hercules made his way to Pluto's throne and bluntly demanded that Cerebus be turned over to him.

"He's yours if you can master him without using your club or your arrows," Pluto replied. In a fearful struggle, Hercules responded by grasping the dog by its throat and by a display of overpowering strength choking the dog into submission.

The story of his twelfth and final labor, the task of getting the golden apples of the Hesperides, will be found told in full under Draco.

Strong man though he was, conqueror though he had been of all sorts of fierce dragons and strange monsters, Hercules came to a tragic end. A centaur whom he had shot told Hercules' wife

as he was dying that if she saved some of his blood it would provide her with a magic charm she could use to hold the love of her husband if she ever suspected that a rival was stealing his affection. Little did she realize how cunningly the centaur had plotted to revenge himself on Hercules. There came a time when she felt that Hercules was falling in love with one of his slave girls, so she dipped his robe in the blood and gave it to him to put on. Rather than turning out to be a magic charm to hold his love, the blood so poisoned the robe that as soon as Hercules wrapped it around him, his skin began to burn as though he had been plunged into fire. The harder he tried to pull the robe away to ease his pain, the tighter it clung to his body and the more terrible became his torture.

Finally he could stand the pain no longer. He built a great funeral pyre of tree trunks, cast himself upon it and set on fire. Then Jupiter descended from Mount Olympus in his chariot of white clouds drawn by four horses. He claimed the body of his son and carried it high up into the heavens to find a place for it there among the stars.

Nowhere in the myth which identifies the Kneeler as Hercules is any attempt made to explain why he is kneeling. In another myth, however, in which this strange giant of the skies is identified as Thanyris, a legendary minstrel of long ago, it is explained that he is kneeling because he is lame, made so by the Muses when they punished him for boasting that his songs far surpassed those composed by these divine sisters to whom men owed the holy gift of song.

In ancient times, minstrels were expected not only to sing and play their musical accompaniments on the lyre but to dance while they sang and played. So sweetly could Thanyris sing, so skillfully play the lyre, and so gracefully dance that he won great fame. Instead of accepting his rise to fame with due modesty, he became so vain that he began to boast how superior he was, not only to all the other minstrels of his time but also to the Muses. Finally he went so far as to challenge the Muses to compete with him in a musical contest in which he could prove his superiority.

It was a rash challenge, this boastful claim by a mere mortal that in his musical ability he greatly surpassed those immortal goddesses who were the daughters of Jupiter. It could be neither forgiven nor condoned, and prompt and cruel was the punishment which the Muses inflicted on the hapless boaster. They put his eyes out, then made him dumb so that he could no longer sing, and finally, to make his punishment terribly complete, they turned him into a cripple, so lame and disabled that he could no longer dance.

LEO, THE LION

For most of the constellations one needs a vivid imagination to be able to see in the patterns of their stars any likeness to the animals or legendary heroes they are supposed to represent. In the stars of Leo, however, it is not too difficult to trace the outline of a lion, his majestic head and mane formed by the curving line of stars known as the Sickle, and his hindquarters and tail, by a triangle of three bright stars.

Unlike the lions of earth, the Lion of the heavens has no tuft of hair adorning the tip of his tail. Originally he did have a tuft, formed by a beautiful little group of sparkling faint stars, but they were taken away by an Egyptian astronomer thousands of years ago to form a new constellation which he suddenly needed to get himself out of a most serious predicament in which he found himself. How this astronomer had brought down on his head the wrath of his king and queen and how he was quick-witted enough to restore himself to favor by creating this new constellation is a fascinating story which will be found in full under Coma Berenices. This is not found in this booklet.

Almost certainly, however, it was for a far different reason than any fancied resemblance to a lion that this constellation was given its name of Leo, the Lion. Some 4,000 years ago, when the zodiac was first laid out, Leo was the constellation in front of whose stars the sun was found in midsummer, having then mounted to the highest point in the sky and shining from there at its hottest and strongest.

To the people of that long-ago time, forty centuries ago, the explanation of why the sun became so overpowering in summer must be that the stars of Leo were adding greatly to the heat of the sun. It was natural, therefore, to compare these stars that were apparently so powerful with the most powerful animal known, the lion, the strong and fierce king of beasts.

Moreover, there was a special association of lions with midsummer heat, for in many ancient lands summer was known as the Time of the Lions. Then it was that lions were made so bold by the overwhelming heat of the sun that they ventured down from their lairs to find relief in the coolness of the river valleys and to create a reign of terror for those who lived there.

In Greek mythology Leo is pictured as the largest and most powerful lion ever known. Like a shooting star it had fallen from the sky into the little Greek valley of Nemea. Its hide was so tough no arrow could pierce it, and so terrorizing the unfortunate inhabitants of that valley that they hardly dared to step outside their homes.

To their rescue came the great hero Hercules. He tracked the lion to its den and tried to kill it with his arrows, but they only bounced harmlessly off. He tried his sword, but it bent as if made of lead. Finally, as the lion made a desperate leap at him, Hercules grabbed it by the neck and with his enormously powerful hands was able to choke it to death in an epic struggle that lasted for thirty days (the length of time it takes the sun to move across Leo in the zodiac).

The body of the slain beast was carried back to the sky whence it had come, and with stars as nails, it was firmly fastened to the great vault of the heavens to take the place in the parade of the constellations where we find it today.

The six stars which form the head of Leo are known as the Sickle because of the way they are arranged in a pattern that resembles the familiar hand tool which is used to cut tall grass. Although Leo's main star, Regulus, which forms the handle of the Sickle, is the faintest of all the so-called first-magnitude stars, it was always a star of great importance to ancient astronomers and astrologers. Originally known as Rex, the King (Copernicus was responsible for changing its name to Regulus), it was considered all through olden times to be the ruler over all the other stars and an absolute monarch whose duty it was to keep them all in order and in their proper places in the sky.

Early English astrologers believed that anyone born under its influence was destined for glory, riches, and power, or as one of them quaintly expressed it: "The Lyon's herte is called of some men, the Royal Starre, for they that are borne under it, are thought to have a royall nativitie."

LEPUS, THE HARE

Night after winter night, Orion, the great hunter of the skies, chases Taurus, the Bull, across the heavens, shaking his uplifted club in the face of the Bull, which glares back at him with his red eye, Aldebaran. Crouching motionless at the Hunter's feet is Lepus, the Hare, an animal Orion is said to have been especially fond of hunting.

It certainly seems strange that the Hare should have taken refuge so close to Orion, but it is possible he realizes Orion is so busy watching the Bull that he can safely hide there at Orion's feet as long as he stays absolutely quiet. Or perhaps he hopes to remain unnoticed there in the very last place that the swiftly pursuing Canis Major, the Big Dog, would ever expect to find him, and thus have a chance to dart off in the opposite direction once the Dog has passed him by.

This hunting scene formed by Orion; his two hunting dogs, Canis Major and Canis Minor; Lepus, the Hare; and Taurus, the Bull, is an example often cited by those who believe that many of the constellations were deliberately mapped out so that a number were formed separately and at random, with no relationship one with another.

Perhaps the most conspicuous example of such a grouping is the way Cassiopeia, Cetus, Pegasus, Andromeda, Cepheus, and Persus have been placed so close together to tell the story of the rescue of Andromeda by Perseus. Other examples are easy to find. The Herdsman, Bootes, needs Canes Veantici, the Hunting Dogs, to help him keep the Big Bear from wandering away from the Pole. Hercules kneels on the Dragon, Ophuichus grasps the Serpent in his hands, and the Archer aims his arrow at the heart of the Scorpion.

LIBRA, THE SCALES

Of the twelve constellations that form the zodiac, Libra is the only one that does not represent something alive. In the early days of Greek astronomy, the stars of Libra were included in the Scorpion to form a double constellation in which the Libra stars represented the claws of the Scorpion. Libra was made a separate constellation in 46 B.C. when the astronomer Sosignines, to whom Julius Caesar had assigned the task of reforming the calendar, decided to honor Caesar by using the claw stars to form the figure of Caesar holding a pair of scales of the old-fashioned balance type. Sosignines intended the new constellation to be an eternal memorial in the heavens to the infinite wisdom and justice of Caesar, but very soon after Caesar's death his figure was dropped out of the constellation picture and only the scales were retained.

Sosignines may have found his inspiration for transforming the claws into scales in the fact that 2,000 years ago, at the time he was working on the calendar reform, the stars he used to form Libra were the stars in front of which the sun was found at the time of the autumnal equinox, when days and nights are equal.

Libra and Virgo are close neighbors among the stars. On some old star maps Virgo is shown with a sword in one hand and a pair of scales in the other. The origin of Libra may be found here in the decision of some ancient astronomer to take away the scales from Virgo and use them to form a separate constellation. When Virgo is thus represented with sword and scales, she is Astraea, the goddess of justice, who lived with all the other gods and goddesses on the earth during the Golden Age when men lived together in perfect peace and happiness. In her scales, Astraea weighed out equal justice to all as she administered the laws for mankind.

The age followed age - the Silver Age, the Brass Age, and the Iron Age. In each one, men lost some of their early innocence and purity, and more and more, truth and honor became forgotten ideals. One by one, in their sorrow over the way the world was changing, the gods and goddesses left the earth and sought refuge on Mount Olympus. Only Astraea remained to the last, and then finally, when she found the world torn by wars and ravaged by crime, she hid her face and flew up into the sky to take her place among the constellations as Virgo. There, with her golden scales, she is supposed to be weighing the good and bad of each mortal at his death and deciding what his lot is to be in the hereafter.

In the old Egyptian star myths, Libra is identified in the same way as being the scales of justice in the heavens by which the life of every man is to be weighed at his death. In one of

the balance pans of these scales is placed the feather of truth, and in the other, the heart of the man whose lot in the afterworld is to be determined. If his heart proves to be lighter than the feather, he gains admittance to the land of the gods, where he can share all their happiness and pleasures. If, however, it proves heavier, he will find himself condemned to the darkness and the terrors of the underworld.

LYRA, THE LYRE

The lyre, which is shaped somewhat like a small harp, was probably the first stringed instrument used in Greece. Homer used it, as did many other of the minstrel poets of ancient Greece, to provide a musical accompaniment as they chanted their stories, much as our folk singers today strum on guitars as they sing their songs.

A dried tortoise shell which Mercury found on the shore is said to have led this god to invent the lyre. As he was quick to realize, the hollow of the shell would make a splendid sounding board if several linen threads or strings of gut were stretched across it.

So Mercury made the first lyre and presented it to Apollo, who in turn gave it to his son, Orpheus. Orpheus learned to play such sweet music on it that birds came to listen as he played and were joined by wild beasts made tame under the music's spell and by sea monsters charmed up from the depths of the ocean. Eventually Orpheus married, but, shortly after, his wife, Eurydice, was bitten by a poisonous snake and died. So great was his grief that he determined to go down where Pluto ruled the underworld and trust to the magic of his music to soften Pluto's stony heart and be permitted to rescue Eurydice and bring her safely back to earth.

At the mouth of the cave which was the entrance to Hades, Orpheus played so sweetly that he was allowed to pass by Cerebus, the dog with three heads, three serpent's tails, and a body bristling with vipers, who stood on guard there. With his music he charmed as well Charon, the ferryman who carried lost souls across the river Styx. Down into the depths of Hades he made his way, so enchanting with his music the terrible ghosts and monsters who lined the pathway that they allowed him to pass unharmed.

Finally he found himself before the throne on which King Pluto was seated. There he played so sweetly that even Pluto, who, as Homer wrote, "never spares, who feels no mercy, who hears no prayers," fell completely under the spell of the music and took pity on Orpheus. He gave permission for Orpheus to take Eurydice back, provided, however, that he went ahead of her and never turned back to look to see if she was following until they both had passed the entrance to the cave and were above ground.

All went well until finally they were almost at the end of their long walk. Sunlight could be seen just ahead at the entrance to the cave. Then Orpheus suddenly realized that he could no longer hear his wife's footsteps behind him. Fearful

that something had happened to her and that she was no longer following him, he turned to look back. As he did so, a great stone dropped down to block the path and hide Eurydice forever from his sight.

For years thereafter, Orpheus roamed the hills and woods, playing only sad tunes on his lyre. Many a maiden fell in love with him, but he remained true to Eurydice's memory and his great love for her. Finally a group of maidens, angry because he would pay no attention to them, banded together to get revenge by killing him. At first, every arrow they shot at him was stopped in midflight by the magic of his music. Only when the maidens began to shriek and yell so loudly that they were able to drown out the music of his lyre did they finally succeed in killing him.

The maidens tossed the lyre into the river along whose banks Orpheus had been walking as he played. Jupiter sent a vulture down to bring the lyre back to Mount Olympus and then placed it in the heavens as a constellation. The vulture, a bird usually represented as plunging down upon his prey, is represented by the heavenly Lyre's bright-blue star, Vega, whose name means the Plunging One of the Falling Bird.

ORION, THE HUNTER

Orion, the only constellation which can boast of having two first-magnitude stars in its jeweled array, is generally regarded as the finest of all the constellations. When it first appears over the eastern horizon in early December, it is the figure of a reclining giant, feet extended to the south, body parallel to the horizon, and head to the north. As Robert Frost says in his poem "The Star Splitter":

> You know how Orion always comes up sideways.
> Throwing a leg up over our fence of mountains,
> And rising on his hands, he looks in on me
> Busy outdoors by lantern-light with something
> I should have done by daylight.

By mid-February Orion has moved over into the southern sky and will be found then standing erect, a giant and majestic figure, an uplifted club in one hand, his tough shield of lion's skin in the other, while at his waist sparkle the three glittering stars that form the jeweled belt from which three fainter stars hang vertically down to represent his sword.

Long ago, we are told, there was only a great dark space in the sky where Orion's brilliant group of stars is found today. How did it happen that Orion was chosen to fill that empty space? An old Greek myth says that Diana, goddess both of the moon and of hunting, fell in love with Orion, the greatest and bravest hunter of ancient times. Although she was supposed to drive the moon chariot across the sky to light up the darkness of the night as her brother, Apollo, drove the sun chariot by day, Diana began to neglect that duty so that night after night she could come down to hunt with Orion.

When Apollo learned that his goddess sister had fallen in love with a mortal man and was no longer attending to her task of driving the moon chariot, he decided to do away with Orion. He saw his chance one afternoon when Orion was swimming far out from shore. He shone his golden rays so blindingly on the swimming figure that it became only a faint dot in the sparkling waves. Then, knowing how proud Diana was of her skill with bow and arrow, he challenged her to hit that tiny far-off target. Without realizing that it was Orion at whom she was aiming, Diana shot so accurately that her arrow hit Orion and killed him.

Not until his body was washed up at her feet on the shore that evening did Diana find out what she had done. Try as she would, she could not bring the hunter back to life. Finally she carried his body to her chariot and drove high up into the sky to the place where it was darkest and where no stars were shining.

There she put the body of her loved one and there the sky suddenly became bright with the stars that outlined his body and his jeweled belt and glittering sword. At his feet to keep him company, she placed his two favorite hunting dogs and marked each with a brilliant star, Procyon in the Little Dog, and Sirius in the Big Dog.

On the winter evenings of February you can find them all - Procyon, Sirius, and the bright stars of Orion - lighting up the southern sky with more shine and glitter than can be found elsewhere in the heavens.

Still another story which explains how Orion came to be given his place in the heavens involves an encounter he had with a scorpion while out hunting. Since the scorpion plays the part of the hero in this story and Orion is the villain, that story would seem properly to belong where you will find it later on when you come to read about the Scorpion.

PEGASUS, THE WINGED HORSE

The main feature of this constellation is the famous Square of Pegasus, outlined by four fairly bright stars some 15 or 18 degrees apart. When the Square first makes its appearance in the east in the evenings of early fall, it resembles a diamond more than it does a square, and you must look at it with head twisted to one side to see it as a square.

There are three strange things about this horse of the heavens. For one, it has wings and can fly. For another, it is usually pictured upside down, legs stretched high above its body and head down. For the third, it is never shown as having either tail or hindquarters, but only as half a horse.

The most famous of the myths about Pegasus identifies it as the winged horse which carried Perseus through the sky as he returned with the head of Medusa tucked away in a pouch under his arm. Neptune, who had loved Medusa when she was young and pretty, created Pegasus by taking white sand from the beaches and mixing it with the rainbow-colored foam of breaking waves and with drops of blood that fell from the severed head. So perhaps the reason why this constellation shows Pegasus with only half a body may very well be that it is supposed to represent the newly created horse just rising out of the ocean with half his body still hidden beneath the waves.

After Perseus had rescued Andromeda, Pegasus flew up to Mount Olympus, where he became Jupiter's favorite steed. Whenever Jupiter wished to use his thunderbolts, Pegasus was sent to bring the thunder and lightning to him.

Once more, however, Pegasus came down to earth, this time to aid the youth Bellerophon, son of King of Corinth. On a visit to another kingdom, Bellerophon had incurred the hatred of the wife of Proteus, king of that land, and she demanded that her husband kill the youth. Proteus, however, knew that Bellerophon, as a guest in his palace, was protected by all the laws of hospitality, and so he sent Bellerophon to his father-in-law, Iobates, with a sealed letter in which Iobates was asked to work out some scheme to cause the youth's death.

It happened at that time that the kingdom over which Iobates ruled was being revaged by the Chimaera, a firebreathing monster with the head of a lion, the body of a goat, and the tail of a snake.

Iobates appealed to Bellerophon to try to conquer the Chimaera, a task seemingly so impossible that by undertaking it Bellerophon would almost certainly be going to his death. The

young man went to the temple of Minerva, the goddess of wisdom, and knelt in front of her altar to pray for her help. As he ended his prayers and turned, he found a golden bridle in front of him, so marvelously beautiful that its like had never been seen before. He realized it must be a sign that Minerva was ready to help him. As he left the temple, there grazing in front of it was a winged horse, evidently sent by Minerva to be used against the Chimaera. It was so tame that Bellerophon had no trouble in putting on the bridle and mounting to ride off to find the Chimaera. In his battle with this monster, Pegasus - for the winged horse was this famous steed - danced and pranced around as agile as a cow pony, keeping Bellerophon out of harm's way while that young man stuffed lead in the fiery flames coming from the creature's mouth where it melted and caused the Chimaera to suffocate.

Unfortunately this great success caused Bellerophon to get a bad case of swelled head. He ordered Pegasus to fly him up to Mount Olympus, where he planned to claim he was entitled to become one of the gods. As they were flying upward, Jupiter, according to one story, hurled a thunderbolt at Bellerophon, but according to another story, sent a sting fly which made Pegasus buck and rear and throw Bellerophon out of the saddle. At any rate, whichever may have been the true cause of his downfall, Bellerophon plunged headlong to the earth, landing with a crash that lamed and blinded him. Alone in his misery, from then on he wandered forlorn, a warning example to those who let their success lead them into vain boasting.

After this adventure, Pegasus returned to Mount Olympus and was presented by Jupiter to the Muses, who had their shrine on Mount Helicon. As he pranced around there one day, a casual kick of one hoof caused the famous spring of Hippocrene to gush forth on the mountaintop. Its waters had the magic power of inspiring anyone who drank of them to gain the gift of writing poetry.

In his poem "Pegasus in Pound," Longfellow tells how "this wondrous steed with mane of gold" strayed down into a quiet country village in New England and was caught and placed in the pound, that is, taken to the fenced-in enclosure on the village common where strayed animals could be kept confined. But Pegasus found those quarters not at all to his liking, and

> To those stars he soared again,
> But they found upon the greensward
> Where his struggling hoofs has trod
> Pure and bright a fountain flowing
> From the hoof marks in the sod.

PERSEUS, THE CHAMPION OR THE RESCUER

As he is usually shown on star maps, Perseus is seen flying across the sky, his winged sandals on his feet, his magic helmet on his head, his sword grasped in his right hand and raised high over his head, and with the head of Medusa held under his left arm.

His mother was Danae, another of the mortal women whom the god Jupiter married. When her son was born, her father resolved to do away with the baby, since he had been warned by an oracle that he would be killed by his grandson. So he put mother and babe into a wooden chest and set it adrift, confident that it would soon sink and that both would be drowned. But the chest floated long enough to drift ashore on an island where a fisherman netted it, broke it open to find the mother and her son, and brought them home to his house. There years later, after the baby had grown to be a stalwart young man, the king of that land, Polydectes, came riding by and was so struck with the beauty of Perseus's mother that he resolved to marry her. However, Perseus took a sharp dislike to the king, who, as it happened, was hated as a tyrant by all his subjects. Polysectes realized he had no chance to win Danae as his bride unless he managed to get rid of Perseus in some way.

So he suggested that it was time that Perseus went on a quest to prove his manhood, as all young men did in those days, and he suggested that a fitting quest would be to get the head of Medusa, who had snakes for her hair and was so ugly that anyone who looked at her was instantly turned into stone. Polydectes hoped, of course, that Perseus would fail and be turned to stone and thus be eliminated as an obstacle to his efforts to get Danae to agree to marry him.

Because he was the son of Jupiter, many of the gods and goddesses were ready to help Perseus. Minerva gave him a highly polished shield and instructed him how to use it when he tried to kill Medusa. Mercury gave him a pair of winged sandals to allow him to fly through the sky. But to get the magic helmet which would make him invisible and the pouch in which to hide Medusa's head if he was successful in getting it, Perseus was told he must find the nymphs who owned them. Only the Three Gray Sisters knew where the nymphs lived and could tell, if they were so disposed, where Perseus must go to find them. These three old women had only one tooth and one eye between them and were constantly exchanging them so that each could have a turn at eating and seeing. Perseus was able to steal up on them without being seen while one Sister was passing the eye on to another and was able to snatch away both the eye and the tooth.

"I have your eye and your tooth," he called out, "and I'll not give them back until you tell me where to go to find the nymphs of the North." So anxious were the Gray Sisters to get back the eye and the tooth that they quickly told Perseus where to go. He found the nymphs willing to loan the magic helmet and the pouch, and so with his magic sandals he flew off to the cave where Medusa lived and where the entrance was guarded by her two sisters. Donning his helmet, he became invisible and passed by the two sisters without being noticed. Now his problem was to get close enough to Medusa to be able to cut off her head and yet never at any time to look at her and be turned into stone. Here he used the polished shield as a mirror as Minerva had instructed him to do, and with it could look back in and watch Medusa's reflection in it:

> In the mirror of his polished shield
> Reflected, saw Medusa slumbers take,
> Then backward an unerring blow he sped
> And from her body lopped at once her head.

He scooped up the head, careful not to look at it, and tucked it away in his pouch. Then, as he flew off on his way home, he met the winged horse, Pegasus, which Neptune, who had loved Medusa when she was young and beautiful, had just created from the foam of the waves, the white sand of the beaches, and the red drops of blood which had dripped down from the pouch in which Perseus was carrying her severed head.

Perseus mounted Pegasus and was swiftly borne along across the sky. Suddenly he noticed a crowd of people gathered on a beach below him. As he guided Pegasus down to look at what was happening there, he saw the chained figure of Andromeda. Just at that moment Cetus, the sea monster, appeared, a terrible and gigantic figure, his sides a mass of barnacle shells around which seaweeds were entwined. The monster saw Andromeda and sped toward his promised prey, Perseus dropped down like a shooting star. He called to Andromeda to hide her face in her hands. His shouts caused Cetus to look up. Perseus raised the flap of his pouch just enough so the monster could see Medusa's head. It was instantly turned into stone. Then Perseus freed the trembling maiden while the throng of people on the beach cheered and cheered.

Like all good fairy stories, it should be easy to guess what happened next. It was, of course, love at first sight for the young man and the fair maiden he had so dramatically rescued. They were married, and then after a while Perseus took her home with him as he came back to report the success of his quest to Polydectes. The king received him, sitting on his throne surrounded by a group of courtiers, all of whom were as hated as he was for their cruel deeds. Perseus raised the flap of his pouch just enough so they could glimpse Medusa's head. Instantly they all became stone statues.

Since that left the kingdom without a king, what better choice could be made for the new king than this young hero who had come back in triumph to end the tyrannical rule of Polydectes and who had brought back with him such a beautiful wife to rule with him as his queen?

Meanwhile, the maidens of King Neptune's court demanded that Cassiopeia must be punished. To satisfy them, King Neptune devised a punishment which would be a most humiliating one for the proud beauty. Seated in a chair, he placed her in the heavens as a constellation which turns every night in a circle around the North Star. For part of every night, Cassiopeia must thus ride upside down, trying desperately to hold tight to her chair and having no time in this position to think about her beauty.

Some years after he became king, Perseus returned to the land where he had been born. There at a great festival, he took part in the quoit-throwing contest and hurled a quoit with such a mighty toss that it flew far beyond the field and on into the stands. There it hit and killed his grandfather, thus fulfilling the prophecy that the oracle had made when Perseus was born, that the king would be killed by his grandson.

The story of the rescue of Andromeda by Perseus is considered by many who have studied the old star myths to be a striking bit of evidence to indicate that the constellations were not laid out and named at random but were mapped out according to rather definite plans aimed at preserving for future generations some of the favorite myths and especially those which told of the deeds of certain of the fabled heroes of ancient times.

Perseus, flying through the sky with the head of Medusa under his arm, needs a whole group of neighboring constellations to write his epic story against the dark background of the sky. Five other constellations, close to him in the heavens, figure in his story: Pegasus, the Winged Horse which he rode through the sky; Andromeda, the Chained Maiden, whom he rescued from the terrible fate of being devoured by Cetus, the Sea Monster; Cassiopeia, whose boasts about her beauty caused Neptune to send Cetus to ravage the shores of the kingdom over which she and her husband, King Cepheus, were the rulers.

In similar fashion, it takes a group of five constellations to tell the story of Orion and his pursuit of the Pleiades, the seven daughters of Atlas, a pursuit which began on earth and now continues in the heavens. The Seven Sisters hide behind Taurus, the Bull, who shakes his angry head and his great horns and glares with his red eye down at Orion as he bars the way and prevents Orion from overtaking the Sisters. The picture of a hunter would hardly be complete without his hunting dogs, and so Canis Major and Canis Minor follow Orion across the sky, while Lepus, the Hare, crouches at Orion's feet to provide the dogs with something to attract their attention and spur them on in their endless chase.

Many other examples could be given to show how often the story told by one constellation is meaningless except when considered in relation to one or more of its neighboring constellations. Thus Sagittarius, the Archer, tirelessly stands on guard with his arrow aimed at the heart of the Scorpion, determined to prevent that deadly creature from creeping over to the opposite side of the sky to try to sting Orion once more. Thus also, Bootes, the Herdsman, must have his hunting dogs, Canes Venatici, so that he can have their help in seeing that the Big Bear does not stray away from its pathway around the North Star.

During the Dark Ages, the science of astronomy was carried on by the Arabs, and many of the stars as we know them owe their names to Arabian astronomers. One example is Algol, the star in Perseus which represents the head of Medusa. Although the Arabs knew the Medusa legend, they chose to replace Medusa by a horrible creature from their own myths, the ghul, and it is from their al ghul, meaning the demon, that has come the name Algol by which the star is known now.

The ghul was a female demon or sorceress who would kill and devour any unfortunate human creature that had the misfortune to cross her path. She would appear to a lone traveler at night, and pretending to be a fellow traveler, would lead him out of his way to his death.

Today Algol is known to be an eclipsing binary, that is, a star which belongs to a system of two stars which move in orbits around a common center of gravity and about each other in such a way that from time to time, as we watch from the earth, they are seen to partially eclipse each other. For some hours while its darker and larger companion is passing in front of Algol, so much of Algol's light is blocked off that it becomes almost 2½ times fainter than it is after that companion passes on and Algol regains its normal brightness.

Neither the Greeks nor the Arabs seem to have had any inkling of this amazing and mysterious change in Algol's brightness. Had they ever become aware of it and of the way the star seems to be winking on and off, they would have been sure that it was possessed by a demon and that in naming it al ghul they had chosen a name which fitted it most aptly.

PISCES, THE FISHES

One day as Venus and her son Cupid were strolling along the banks of a river, they were frightened by the sudden appearance of Typhon, a monster dragon who breathed fire from his nostrils and had a hundred ugly dragon heads. To escape from him, they changed themselves into fishes and dove deep into the river where Typhon, who could live in flames and fire but not in water, could not follow. In order not to become separated from each other, they tied themselves together with a long cord, and it is in this way that this constellation is pictured, with two fishes a considerable distance apart in the sky but joined together with a line stretching from the tail of one fish to the tail of the other.

Some time after this encounter, Typhon led a revolt of the giants and dragons against the rule of Jupiter. It lasted for ten years, and at the end of that time Typhon was the only survivor among the rebels. He had finally been subdued after a terrific struggle when Jupiter hurled a thunderbolt at him, which knocked him into the sea and left him unable to defend himself. Then the gods tied him up with stout cords, and to hold him down forever after, they dropped the three-cornered island of Sicily over his body. On his head they piled Mount Etna, and the tongues of fire which from time to time flare up from that famous Italian volcano represent his fiery breath as he vents his anger at being so confined.

Because fishes are creatures of the ocean deeps, they seem to have been regarded in these old myths as being able to salvage gold and precious gems from sunken treasure ships. One old myth tells the story of a poor fisherman whose only possession was his humble cabin. One day he caught a fish which amazed him by starting to speak to him. The fish said that he was an enchanted prince, and that if the fisherman would let him go, any wish which the fisherman cared to make would be granted. The fisherman let the fish go, but out of the kindness of his heart refused to ask for any reward.

When he told his wife what had happened, she scolded him bitterly for not having taken this chance to become wealthy. So constantly did she continue to scold and nag that finally he went back to the shore and called for the fish to return. It did, and when the fisherman said his wife wanted him to ask for a fine house with splendid furniture, the fish told him to go back and he would find his cabin turned into such a mansion.

If the wife had been content with this good fortune, all would have been well. However, she decided she wanted to be a queen and have a palace. In turn, this wish was granted by the fish, but when the greedy woman next demanded to be made a goddess, the fish not only refused but took away everything that he had given, so that once more all the couple had was their crude cabin

by the seashore. Always when this story was told, it ended with this moral: "Beware of the way the gods deal with those who become too greedy!"

Pisces is the constellation which ancient astrologers regarded as the sacred symbol of the Jewish people. In medieval times it was identified as the fish with which Jesus fed the multitude who had gathered to hear him preach in the desert place near the city of Bethsaida. The fish became a symbol used by the early Christians, and today the figure of a fish is often found as one of the features on stained-glass church windows.

According to an ancient Jewish tradition, a triple conjunction of the planets Jupiter and Saturn in front of the stars of Pisces took place just before the birth of the great Jewish leader Moses. Another such triple conjunction also in front of Pisces was expected to announce the birth of the long-awaited Jewish Messiah. Such a triple conjunction is known to have occurred in 7 B.C. and is perhaps the most widely accepted explanation for the famous Star of Bethlehem, which led the Wise Men to Jerusalem and from there to the manger birthplace of the Christ Child.

SAGITTARIUS, THE ARCHER

Long ago, a strange race of fabulous creatures, the centaurs, half man and half horse, lived on Mount Pelion in Greece. They had the legs and body of a horse, but the head, chest, and arms of a man, and this combined the power and speed of a horse with the brains of a man and a man's cleverness in the use of his hands. Savage creatures, more like beasts than man, they were known for their evil ways and cruel acts.

One centaur, however, Chiron, became known everywhere for his goodness and great wisdom. He became a famous teacher to whom kings and princes sent their sons to be trained and educated. Among his pupils were Aesculapius, who became the most famous physician of ancient times, and many of the better-known Greek heroes, including Hercules, Jason, Achilles, and the twins Castor and Pollux.

Alone among the centaurs, Chiron was immortal, but there came a time when of his own accord he chose to die rather than to keep on living. He had been accidentally wounded by an arrow shot by Hercules, a wound which would have been fatal to any mortal, since Hercules had dipped all his arrows in the poisonous blood of Hydra, the Water Snake, after he had slain that creature. Because Chiron was immortal, the poison could not kill him, but it did cause him such constant and extreme pain that he begged Jupiter to allow him to die rather than to live in neverending agony. Jupiter granted his request, and after his death placed Chiron in the sky as a constellation where he would shine in the same way that he had been a shining example on earth of kindliness and wisdom.

Before he died Chiron made an important contribution to the success of that famous voyage which the Argo made to get the Golden Fleece. The Argo was the first ship that had ever been built which was large enough so that its sailors dared to venture far from port and into strange seas and uncharted waters where no Greek sailors had ever ventured.

When they sailed out of sight of land, as they must do, how could they be sure what was the right direction to keep the Argo headed, especially in the darkness of night? Without any way to keep their ship on its proper course for it was long before the invention of the compass, they would be likely to sail aimlessly around in circles just as someone lost in the woods is apt to do.

Chiron provided the answer. He had studied the stars for a long time and had learned where each of the brighter stars made its first appearance over the eastern horizon in evening and how it moved across the sky night after night before finally disappearing below the western horizon. He realized that to recognize and keep track of each of these many stars would be a most difficult task, but one which could be made much easier and simpler by forming them into orderly groups. Then he proceeded to do so by laying out the constellations for the first time. Then he taught those who were to be the navigators on the Argo how to recognize these constellations and how to use them to steer by.

The constellation of Sagittarius, Chiron created as a memorial to himself. So famous was he as the finest archer that by grouping the stars to outline the figure of a centaur with bow drawn and arrow aimed he knew the Greeks would recognize at once who the constellation was supposed to represent even though he did not label it with his name. In much the same way, a statue in Paris of an officer labeled only "The Great General" would be understood at once by every Frenchman to be representative of Napoleon.

Other stories give still other and somewhat different explanations of how Chiron found his place among the stars. Orion was one of his favorite hunting companions, and when Orion died after having been stung by the Scorpion, Chiron was given a place in the sky close to the Scorpion where it might be possible for him to use his bow and arrow to avenge the death of his friend. In still another version of this story, it is said that after Jupiter had placed Orion in the winter end of the sky and the Scorpion would never be tempted to creep back across the sky to try to sting Orion again.

The stars of Sagittarius form a figure which greatly resembles a teapot. Four stars on the left side of the Teapot form its handle, while over to the right, the stars that outline the Archer's arrow form the spout of the Teapot. On a clear evening the Milky Way can be seen close to the spout, looking like steam coming out of it. The stars which form the handle of the Teapot also form the bowl of a dipper that is seen upside down with its handle pointing up. This is the Milk Dipper of the heavens, so called because it lies in the Milky Way.

SCORPIUS, THE SCORPION

In the summer skies, the Scorpion is the constellation which rivals in beauty and majesty the winter constellation of Orion. Its long, curving line of stars resembles a capital letter J. Its brightest star, Antares, is the reddest of all the bright stars in the heavens. In the time of Confucius in China, it was known as Who Sing, the Great Fire, and for many centuries it was worshipped by the Chinese, who offered sacrifices to it to gain protection from the danger of fire.

The Greeks, who knew the god of war and the planet named for him as Ares, gave the star its name of Antares, which means "rival of Ares," while we who call the planet Mars, as it was known to the Romans, would refer to Antares as "rival of Mars." It is an appropriate name for a star whose color so closely resembles the red of the planet that they look like red twins whenever they are close together in the sky as they usually are found for a few nights whenever Mars is making one of its close visits to the earth.

According to the old myths, there is a special reason why Orion is a winter constellation and the Scorpion is a summer one, and why, as Aratus wrote:

'tis said that when the Scorpion comes
Orion flees to the utmost ends of the earth.

Orion, you will remember, was the greatest hunter of olden times, so successful that he grew very swellheaded and was fond of boasting that no animal could ever harm him. Finally Juno, Jupiter's wife, became so tired of hearing his boasts that she decided she would show him how idle and vain was his boasting by having him killed in a most humiliating way by as tiny and insignificant animal as she could find. She selected a scorpion, a creature that while only six or eight inches long has a deadly poisonous stinger in its tail.

One morning the scorpion lay in ambush close to a trail that Orion liked to use on his daily hunting trips, stung him in the heel as he passed, and caused his death. Diana, the goddess of the moon, was in love with Orion, and when she learned of his death, she begged Jupiter to place him as a constellation in the heavens where every night she could see him as she drove the chariot of the moon across the sky. Then Juno demanded that if Orion was to be given an honored place in the sky and was to be immortalized in this fashion, Jupiter put them both in the sky, but shrewdly place them so far apart, one in the summer sky and the other in the winter sky, that there would be no danger that Orion might seek to revenge himself on the animal that had caused his downfall.

In the star pattern of its tail, the Scorpion resembles a fishhook, and by the natives of the South Pacific is known as Maui's Fishhook. Maui, a legendary Polynesian hero, once stole the pet fishhook of his brothers and managed to get it snagged on the bottom of the ocean. He dove down to try to free it and tugged and tugged until he finally got loose. When he pulled it up behind him as he swam to the surface, he found that he had hooked an island, complete with grass and trees and hills, and even with men and women going about their daily tasks. Proud of his feat in making this extraordinary catch, he pulled out the fishhook and tossed it high up into the sky where it lodged and hung to form the Fishhook, as the Polynesians refer to the Scorpion. The island, still known through the South Pacific as Te-Ika-a-Maui, is the island which we know as New Zealand.

TAURUS, THE BULL

Head lowered, his long horns tipped forward, and his red eye glaring ferociously down at Orion and his dogs, Taurus, the Bull, seems to be backing slowly across the sky as Orion, that mighty hunter of the heavens, chases after him with uplifted club.

Only the head, the horns, and the upper half of the Bull's body are outlined by the stars which make up this constellation. Why the rest of its body cannot be seen finds its explanation in the story of the kidnapping of Europa, a beautiful maiden with whom Jupiter had fallen in love. Disguised as a snow-white bull, Jupiter came down from Mount Olympus one day to where Europa was playing in a flower-decked meadow. So pretty and so gentle was the white bull that Europa ran over to it, patted it and finally climbed on its back. Then off sped Jupiter, on down to the seashore, where he plunged into the waves and swam with his captive across to the island of Crete. There Jupiter revealed himself as the king of the gods and won Europa as his bride.

It is Jupiter in his disguise as a bull that Taurus is supposed to represent among the stars, the lower half of his body hidden below the sea just as he looked when, half submerged, he swam to Crete with Europa. Why she is not shown clinging to his back, none of the old stories tell, but the Greeks made sure she would not be forgotten by naming one of the great continents of the world after her.

The stars which form the head of Taurus are grouped in the shape of a V which points like an arrow at the head of Cetus. In and around that V is a group of stars, the Hyades, which is perhaps the finest cluster of stars in the heavens and one of the most amazing and beautiful sights to be seen in binoculars. "Some day," the late Henry Nealy, dean of the lecturers at the Hayden Planetarium, once wrote, "I hope an imaginative designer will duplicate this superb setting of celestial gems, matching them in color, sparkle, and design. His only chance of failure will be in trying to improve them. It could not be done."

In ancient times this cluster was known as "the rainy Hyades," probably because thousands of years ago it made its first appearance of the year low in the east just before dawn at the time the spring rains began. Still another explanation for its rainy reputation is that the Hyades are sometimes identified as the daughters of Atlas and were changed into stars because they wept so long and so bitterly when their father was condemned to stand forever holding up the world on his bowed and aching shoulders. Even in the sky they continued to grieve, and it is their tears which pour down as the showers of spring.

Probably the best-loved group of stars in the heavens is the other cluster of faint stars, the Pleiades, which is also found in Taurus.

It is a cluster which can be seen from every civilized country in the world, and mankind, over all the ages, has felt for it the love and reverence which is so beautifully expressed in these three lines found in "The Pleiades," a poem written by one of our modern poets, Elizabeth Coatsworth:

> Sweet as violets to a weary heart,
> Haunting as the lovely names in old tales,
> Beloved as a man's own fields are the Pleiades.

Varied and colorful are the names which have been given to the Pleiades. In India, the cluster was known as the flame of the fire-god; in Finland, as a sieve; in France, as a chicken incubator; in Poland, as a group of old wives; in Arabia, as a herd of cattle; in Babylonia, as the Many Little Ones; and in Polynesia, as the Little Eyes.

Perhaps the most familiar of the poetic tributes which have been paid to the beauty and magic of the Pleiades are these famous lines from Tennyson:

> Many a night I saw the Pleiades, rising thro' the mellow shade,
> Glitter like a swarm of fireflies tangled in a silver braid.

Later on in "The Pleiades," Miss Coatsworth asks,

> What magic is there in this little cluster
> To hold the human spirit from generation to generation?

The answer requires going back thousands of years to the time when the people of ancient times first made the discovery that they could tell when the seasons were due to change by watching to see what stars were rising low over the eastern horizon just before the sun came up to blot them from view. From 4300 B.C. to 2100 B.C., it was the Pleiades for which eager watch was kept for the morning when this cluster would reappear in the east to herald in the calendar of the heavens the arrival of spring with its promise of welcome warmth and the resurrection of growing things after the cold and gloom of winter.

All over the ancient world, that day of the spring equinox was the most important day of the year, a day of universal rejoicing, observed everywhere with great festivals at which homage was paid to the Pleiades as the beloved symbol of spring. It was the day selected on which to begin the new year, a far more meaningful New Year's Day than our January 1.

The Pleiades is one of only three star groups referred to in the Bible. The reference is found in the thirty-first chapter of Job, where the question, "Canst thou bind the sweet influences of the Pleiades?" appears as one of the many questions that God commands Job to answer. It was the close association of the Pleiades to the return of spring long ago that explains why God refers to their "sweet influences." In effect, his question to Job is, "Can you do anything to hinder or delay it?"

Easily seen on a clear moonless night by anyone with reasonably good eyesight are six stars in this cluster, arranged to form the sky. Long ago there must have been seven such visible stars, for the ancient name for the cluster is the Seven Sisters, old Greek myths identifying them as seven very beautiful and graceful sisters who loved to dance among the flowers in the meadows. One day while hunting, Orion suddenly came upon them as they were dancing and watched enchanted. So shy and timid were the sisters that they ran off in terror as soon as they caught sight of the gigantic hunter. Orion pursued, and the sisters appealed to Jupiter for help. He turned them into doves, and they flew off to take refuge among the stars, alighting on the back of Taurus, the Bull, where they found protection behind his golden horns from the still pursuing Orion. There in the sky the chase still continues to this day, for every winter's evening soon after the Pleiades rise above the horizon, Orion appears in close pursuit of the Bull and the Pleiades.

All over the ancient world in nations far apart in Asia and Europe, there seems to have been a common transition that one of the Seven Sisters disappeared from the cluster way back in the remote past. All sorts of explanations were offered to account for why the star that represented that seventh sister could no longer be seen in the Pleiades.

The Greek explanation was that the lost Pleiad was Electra, mother of the founder of Troy, who left her place in the sky so that she could hide and not have to watch the destruction of that city and was never able to find her way back.

Our North American Indians told of a group of seven little Indians who joined hands every starlit night to dance happily under the stars, who looked down and learned to love the children. One night, when the children had had so little to eat that they were too hungry to dance, the stars invited them to come up to join them in the sky. There they were grouped together to form the Pleiades. After a while, however, one of the little Indians became so homesick that he hid his face in his hands and wept bitterly. Naturally enough, his star was so hidden behind his hands that it became too dim to be seen.

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Halfway across the world from Greece in the other direction from North America, the People of Mongolia say that the missing Sister is the star Alcor, the little star close to Mizar, the middle star in the handle of the Big Dipper. According to one of their myths, the stars of the Big Dipper are robber stars, proud of their brilliance and ever anxious to add to their array. On one of their raids they stole one of the Pleiades and brought it back to add to their array. In Asia Alcor is known as Huitang, the Cold Star, so named to picture its distress at being kidnapped from the warmer regions near the equator of the heavens, where as one of the Pleiades it crossed the sky, and was carried to its new position in the Dipper handle to shiver there high up in the icy north.

Of all the stories about the Pleiades, one of the most interesting comes from the Polynesian Islands, where the natives know this little cluster of stars as Mara-riki, or Little Eyes as that name would be translated. Long before man made his appearance on the earth and long before the Pleiades made their appearance in the heavens, the star Aldebaran, according to this myth, had as a near neighbor a star so supremely bright that it far outshone Aldebaran and was even much brighter than Sirius, our brightest star today. So proud and conceited did this star become that it was fond of boasting how much brighter it was than any other star and how pale and faint both Aldebaran and Sirius appeared in contrast.

Finally it began to boast that it was more beautiful than any of the gods. Then the gods decided it must be driven from heaven, and they appointed Tane, guardian of the four pillars of the heavens, to carry out this decree. Tane asked Sirius and Aldebaran for their help and found them most willing to aid him, so greatly had they come to resent the constant boasts and taunts hurled at them by their swellheaded neighbor.

Together, Tane, Aldebaran, and Sirius headed for the bright star, but he saw them coming and ran and hid under the waters of the heavenly river, the Milky Way. It proved impossible to find him until Sirius had the happy idea of going up toward the source of the river and damming up its waters. As the riverbed dried up, the boaster could be seen again where he had been hiding, but he ran off once more so fast that his three pursuants could not catch up with him.

Finally Tane picked up Aldebaran and, with a mighty toss, hurled it at the fugitive. It hit him such a powerful blow that he was smashed into seven small fragments. They limped back into the sky to the place where the bright star had been located, close to Aldebaran. No longer were they bright enough to make Aldebaran pale by contrast, and now Sirius reigned as the brightest of stars.

Today, although the Pleiades no longer boast of their brightness and their beauty, it is said that occasionally they look down on a dark clear night at their reflection mirrored below in the ocean and whisper to themselves that they are really more lovely now as the Seven Sisters than they were when they formed one star.

In a star myth told in Arabia, Aldebaran, the bright star of Taurus, is said to be a man who once came to woo one of the Seven Sisters but was rejected because he was so poor. Later on, having become very wealthy, he came back, driving in front of him all his camels (the Hyades) to show how rich he had become and hoping to be more favorably received. The Sister he was wooing would still have nothing to do with him, but the rich man nevertheless persists, hoping that the continued show of his wealth will eventually break down her resistance.

URSA MAJOR, THE BIG BEAR

Usually when people think of the Big Bear, they think of the Big Dipper, but as the constellation picture shows, the Dipper stars form only the tail and the hindquarters of the Bear, and a number of fainter stars must be added to outline his head and legs.

How carefully did you look at the picture of the Bear? Did you notice anything strange about this Bear of the heavens? Sometimes youngsters say he doesn't look like a bear, but I think he does, and at any rate, that is not what makes him look so strangely different from the bears we are familiar with on earth.

Look again carefully. Have you ever seen a bear with a long tail? The two heavenly Bears have long tails, and there are several myths which try to explain why they have long tails while the bears on earth have almost no tails at all.

One explanation starts off by saying that Jupiter came down to earth from time to time from his palace on Mount Olympus to marry one after another a series of beautiful earth maidens who had caught his fancy. One of them was Callistro, and when her son was born, she named him Arcas.

Juno, the goddess wife of Jupiter, was always very jealous of these mortal maidens whom her husband married, and she tried in every way she could to punish them for stealing Jupiter's affections. She scolded at Callistro, saying, "I will take away that beauty with which you charmed my husband. I will turn you into a bear, and then when other maidens see how ugly you have become, they will take care not to offend me as you have done, knowing what their fate will be if they do."

For years thereafter, Callistro roamed as a bear through the forests of her homeland while Arcas grew to be a stalwart young man and a famous hunter. One day he trailed a bear through the woods and was just about to shoot an arrow at it, not realizing that it was his mother whom he was about to kill. However, Jupiter, who as the great god of the world, knew of course, everything that was happening in it, intervened just in the nick of time to prevent the tragedy. He turned Arcas also into a bear, and then, grasping each bear by its short, stumpy tail, he gave it a mighty heave high up into the heavens, where it landed near the North Pole of the sky. So heavy were the bears and so great the strain on their tails as they were tossed skyward that their tails were stretched out into the unusual lengths found on these heavenly bears.

This tale of tails always reminds me of the quaint way in which Thomas Hood, a seventeenth-century English astronomer, phrased his explanation of why Ursa Major's tail was so long. "I imagine," Hood wrote, "that Jupiter fearing to come too nigh unto her teeth, layde holde of her tayle, and thereby drew her up into the heavens, so that she of herself, being very weightie, and the distance from the earth to the heavens very great, there was great likelihood that her tayle would stretch. Other reason I know none."

As Juno saw the two Bears shining brightly in such a prominent place in the sky, she angrily realized what little success she had had in trying to make her rival Callistro so ugly. She was still determined to get revenge on the maiden whose beauty she had tried so hard to destroy, but who was now in the heavens more beautiful than ever. "I made her ugly," she raged, "but now she is beautiful again. She has been rewarded when I wanted her to be punished."

So Juno went to Neptune, Jupiter's brother and the ruler of the seas, and asked him to drive the stars of the Big Bear away from his waters every time they dropped down near them and never to let them bathe in the waves of the sea as all the stars liked to do when they had completed their long crossing of the sky and were wearily dropping down to the western horizon. Neptune granted her request, and since a god's decree once given can never be changed, the Bear never is allowed to bathe in the water.

In the latitude of Greece, the Big Bear is a circumpolar constellation, that is, one which never drops down low enough to disappear below the horizon, but always remains visible as it circles around and around the North Star. The Greeks, who had no understanding of how the curvature of the earth affected the visibility of this constellation, attempted to explain in this story of Callistro and Juno why, as Homer says in the Odyssey,

> The Great Bear, which alone of stars
> Will never enter the bath of ocean.

In England the Big Dipper is known as Charles's Wain, the bowl being thought of as a wagon, or wain, and the stars of its handle, as the horses. It is also known there as the Plough, the bowl stars this time representing the plowshare, and the handle stars, the horses that are pulling it. To the Arabs, the Dipper represented a funeral procession, the bowl being the coffin, and the handle stars, the mourners marching behind.

Seemingly only an inch away from bright Mizar, the middle star in the Dipper handle, is a faint star, Alcor, which is a well-known test of eyesight. The gap between these two stars which seems so tiny is actually so great that light, moving as it does at the speed of 186,000 miles a second, would take nearly

three months to cross the 1,500,000,000 miles which separate these two stars. That is a distance some 16,000 times the 93 million miles between the earth and the sun.

By the North American Indians, Alcor was known as the "Papoose on the old Squaw's back," and in England, it is known as "Jack on the Middle Horse." In German folklore, Alcor is Hans, the wagoner who once gave a poor tired man a ride, only to find that it was the Saviour he had helped. In recognition of his kindness, Hans was offered any reward he cared to ask for, but all he requested was to be allowed to drive like the sun from east to west through all eternity. He was placed in the sky as Alcor, which once every twenty-four hours swings from east to west around the North Star.

Of the many myths handed down by the North American Indians, perhaps the most interesting one gives a unique explanation for that annual miracle, the beautiful color changes in autumn of the leaves on the trees of the northern woods. It seems that once an Indian tribe was enjoying a happy and peaceful existence in a valley where game of all sorts was plentiful. One day a monster bear made his way down into the valley, and the deer and the rabbits fled so far away in panic that the Indians could find nothing to shoot and soon found themselves starving. The three sons of the chief, young men just beginning to gain fame as warriors, took a solemn oath to chase and kill the bear. Their chase is pictured in the heavens by the stars of the Big Dipper, whose four bowl stars represent the bear while the three stars in the handle represent the hunters.

The hunter nearest the bear is ready with bow and arrow. Behind him follows a brother who is carrying a kettle in which the bear is to be cooked as soon as it is killed. It is the little star, Alcor, so close to the middle star of the handle, which is supposed to represent the kettle. Bringing up the rear is the third brother, and it is his task to collect stars to be used as coals to make the fire under the kettle.

Not until autumn does the hunter with the bow and arrow decide he is close enough to shoot. So well does he aim that the bear is seriously wounded and from his side great drops of blood fall from the sky down on the leaves to color them red in that flaming transformation of color which makes the woods so beautiful each fall.

Before the Indians can finish off the wounded bear, Glooksay, the Indian god, calls a truce. Bear and hunters sit down with him to smoke from the pipe, settling down over the fields, which causes the misty haze of the October days of Indian summer. All winter the bear is given a chance to recover from his wound, but year after year when spring begins, the chase is resumed, not to end until once more in autumn the arrow is shot and once more the red drops spatter down to color the leaves and cause the trees to burst into flaming glory.

If you look for the seven stars of the Big Dipper in November, they will be so close to the northern horizon in the evening that they will be hard to find if trees or houses block off a clear view of the low north. When the Dipper reaches this position, the bears, according to still another Indian legend, know it is time to hibernate, that is, to crawl into the dens they have dug underground and there, snugly curled up, sleep through the cold winter months.

Long ago, however, as an Indian legend tells the story, the bears had not learned what to do when winter came, and so, caught outdoors in the winter cold of zero degrees, they suffered terribly as their noses and their toes froze. Finally they went to their Great Spirit for his help, and it was then that he taught them how they could escape the cold by hibernating.

That seemed a happy way to solve their winter troubles, but since they had no way of keeping track of the seasons, next year they were again caught outdoors when winter began and again suffered as their noses and their toes froze. Again they went to their Great Spirit for help. This time he took a big bear and a little bear and put them into the heavens to form Ursa Major, the Big Bear, and Ursa Minor, the Little Bear. Then he started these heavenly bears moving in a great circle around the North Star in just the opposite way that the hands of a clock move.

"I have put them there in the sky," he announced to the bears, "as a sign to tell you when winter is coming. In the evenings of summer, you will find the Big Bear up above the Little Bear. But watch as the Big Bear moves lower and lower as time passes. Finally, when you find him down below the Little Bear, you will know the time has come for you to go to your dens and get ready for your winter sleep."

So it is when winter is just around the corner, the Big Bear is found in the evening sky barely above the northern horizon and below the Little Bear in the position which long ago the Great Spirit of the bears promised them would be his sign set in the heavens to warn them it was time to begin their winter hibernation.

URSA MINOR, THE LITTLE BEAR

When Callistro was turned into a bear, a story that has already been told in discussing Ursa Major, her son, Arcas, was also turned into a bear and tossed by Jupiter so high up in the heavens that it landed at the very top of the sky. There it still hangs, the tip of its tail nailed into place by the bright star Polaris, our North Star. The weight of its body, as it has endlessly swung round and round the pole of the heavens, has caused the tail to stretch more and more until now it is longer even than Ursa Major's, and, of course, far out of proportion in comparison to the stubby tails of the bears of earth.

The Little Bear is better known to us as the Little Dipper, its seven stars forming a much smaller dipper than the seven which outline the Big Dipper. Four of its stars are so faint that they are not easily seen, and so to trace the Little Dipper in the sky poses a far more difficult task than that presented by the Big Dipper whose stars are all bright enough to be easily found.

One of the Little Dipper's stars, Polaris, our North Star, is, however, probably the most important star in the heavens. Only of second magnitude and thus not a particularly bright star, its importance rests in the fact that for thousands of years, it had been the guide star for those who sail their ships across the oceans of the North Hemisphere and for those who lead caravans through the trackless wastes of desert lands.

The North Star is visible every clear night and is easily located by using the Pointer Stars of the Big Dipper, stars which every Boy Scout and Girl Scout must learn early in their scouting careers. They are the two stars which form the side of the Big Dipper bowl opposite to the side where the handle is joined to the bowl. An imaginary line from the lower Pointer star to the upper will always point like an arrow at the North Star, regardless of what position the Big Dipper may be in as it circles the Pole.

The first historical record of the use of stars in navigation is found in the Odyssey, when Ulysses is told by the goddess Calypso, on whose island he had been shipwrecked, to keep ever to his left "the Bear which they likewise call the Wain, which turneth ever in one place, and alone hath no part in the bath of heaven." Thus Ulysses would be heading east as he set sail from the island to begin his voyage back to his homeland.

For centuries, up to at least 650 B.C., Greek sailors used the Big Bear in this way to navigate by. Much earlier, however, by 1000 B.C., Phoenician ships had taken over the lead in the

trading voyages on the Mediterranean Sea, and their sailors had learned that north could be located far more accurately by using Polaris to steer by.

When the Greeks finally made the change to Polaris, they called it Cynosura, from which we get our word "cynosure," which means the center of attention, which of course, the North Star became.

In a famous passage in Shakespeare's play "Julius Caesar," Caesar declares to the conspirators just before his assassination:

> But I am constant as the Northern Star
> Of whose true-fixed and resting quality
> There is no fellow in the firmament.

Yet despite Shakespeare and popular belief even today, Polaris, the North Star, is not "true-fixed" and has not been the North Star constantly through the past nor is it destined to mark true north in the heavens forever in the future. The star Thuban, in the constellation of Draco, was nearest the North Pole of the sky some 4,000 years ago, and it is only in the last 2,000 years that Polaris has moved close enough to celestial north to qualify as the North Star. By the year 10,000, Deneb will have taken over in its place, and 4,000 years later, Vega will be the closest star to celestial north.

These changes occur because the earth is wobbling in much the same way that a slowing-down top wobbles. The earth's wobble is so slight and so slow that only after a long period of years does it become apparent that the earth's axis has not been pointing steadily at a fixed point in the northern heavens but has been tracing out a great circle among the stars there. In the lifetime of any person, the change in direction at which the axis points is far too slight to be noticeable. Only after thousands of years have passed does it become evident that there has been enough change so that a star that has reigned as the North Star for many centuries is no longer the star toward which the earth's axis is pointing, but that some other star has taken its place as the nearest star to the North Pole of the heavens.

It takes the earth nearly 26,000 years to complete one of its wobbles. During that time star after star takes its turn as the star which for a period of several thousand years will most nearly point out the place of true north in the sky.

To the Arabs, Polaris is known as Al Kiblah, "the direction star," because it points out for all Moslems, wherever they may be, the right direction to turn to face toward Mecca at the hour of prayer.

The two stars in the Little Dipper's bowl on the opposite side from where the handle joins the bowl are the only stars except Polaris in this constellation which are bright enough to be seen easily. They are known as the Guardian Stars, and as the two Dippers swing around, they are always found stationed between the North Star and the stars of the Big Dipper, on guard to prevent Polaris from being stolen by the Big Dipper stars, robber stars who have already brought back one star, Alcor, from the Pleiades and are always on the prowl to see what other bright stars they can steal to add to their already bright array.

VIRGO, THE VIRGIN

On the old star maps, Virgo is usually represented as a woman with wings who is standing and holding a palm branch in her right hand and an ear of wheat in her left.

The best-known of the myths about Virgo identifies her as Ceres, the goddess of growing things to whom the farmers of long ago offered their prayers and made their sacrifices in the spring so that their crops might prosper and their harvests prove bountiful. Usually Ceres could be counted on to respond favorably to their prayers and give her blessings to the growing things in their fields. There came a summer, however, when no trees ripened their fruits and when the fields dried up and nothing grew in them. All this occurred because one day Ceres' lovely daughter, Proserpine, disappeared suddenly, and search though she might, Ceres could neither find her nor anyone who could give a clue where she had gone.

Frantic with grief, Ceres decreed that nothing was to grow on earth until Proserpine was found and back home. All over the world the most dreadful and cruel year in the history of mankind began. Not a seed which was planted sprouted, and everything that had been growing died. The world faced an autumn when there would be no crops to harvest and when a famine would end man's existence on the earth.

Finally Apollo, the sun-god, who of course sees everything that happens in the daytime as he drives his chariot across the sky, told Ceres he had seen the earth suddenly open wide enough to allow a chariot drawn by four coal-black horses to come up from below bearing Pluto, the god of the underworld, who had kidnapped Proserpine and carried her away to become his bride and the queen of Hades.

Ceres asked Jupiter to aid her in getting her daughter back. Jupiter was ready to help because he saw that he must act or the whole race of men would be wiped out. He ordered Pluto to return Proserpine to her mother, but Pluto replied that it was not possible because Proserpine could return only if she had not eaten anything while she had been below in the underworld. In her sorrow at being taken away from Ceres, Proserpine had refused to eat, although Pluto had tried to tempt her with all sorts of delicacies that he had had his cooks prepare. Only once, as it turned out, had Proserpine eaten anything and then only six tiny seeds of a pomegranate, a kind of fruit.

Faced with the problem of what to do because she had eaten those seeds, and pulled one way by Ceres and the other by Pluto, Jupiter finally worked out a compromise by which Proserpine was to spend six months of each year with Pluto and six with Ceres. So it is that when she comes to spend these months with her mother, Ceres is so happy that she smiles on the fields and they bring forth crops abundantly. But when Proserpine returns to Hades, Ceres is so sad and lonely that she no longer cares what happens, and she allows the world which had been so warm and beautiful in spring and summer to become cold and dreary under the icy tyranny of winter.

The people of ancient times had, of course, not the slightest inkling that the seasonal changes of the year were the result of the way the tilted earth made its annual journey around the sun. So this story of Ceres and Proserpine which tells of a maiden who must spend half of the year a captive down below in Hades before she can return in triumph in the spring was their attempt to explain the great mystery of the seasons and why the winter death of growing things is followed by their revival and resurrection with the coming of spring.

Brightest of Virgo's stars is the beautiful white first magnitude star Spica, which marks the ear of wheat which Virgo holds in her hand. It rises low in the east in early evening about the first of April, an hour after Arcturus, the red-gold star in Bootes, has risen farther to the northeast. Long ago these two stars played an important role in the heavenly calendar by which the Chinese had found it possible to keep track of the seasons. Calendars are such a commonplace in our lives today that it is hard to realize that the people of ancient times had no such convenient way to keep track of the progress of the year and to mark when the seasons began and ended. The Greeks learned to expect spring to begin when the Pleiades first appeared in the east just before the sun rose to blot out the stars. The Chinese depended on Spica and Arcturus to provide the sign in the heavens which would tell them that the long dreary winter was drawing to a close and spring was about to begin.

Spica and Arcturus formed a pair in the sky which the Chinese called the Horns of the Dragon. In the Chinese calendar spring began on the evening when the full moon rose between these two stars, riding, as the Chinese said, "on the Horns of the Dragon." How eagerly the Chinese must have watched the sky as the long winter dragged along and how they must have rejoiced when at last Spica joined Arcturus in the early evening sky and they knew they had only to wait for the full moon to rise between these stars to proclaim the glad tidings that winter's icy grasp was being broken and spring with its renewal of warmth and life was about to begin!

TEST A

1. What zodiacal character is represented by a giant holding a huge upturned urn from which an unending stream of water was pouring out?

   (a) Pisces (b) Capricornus (c) Aquarius (d) Gemini

2. Of the four birds represented as constellations, three were placed there by the gods. Which one was not?

   (a) Dove (b) Eagle (c) Aries (d) Swan

3. What is the first constellation in the zodiac?

   (a) Taurus (b) Gemini (c) Aries (d) Aquarius

4. What ancient constellation honors a crippled king who supposedly invented the chariot?

   (a) Cepheus (b) Orion (c) Perseus (d) Auriga

5. One story gave credit for inventing the plough to benefit all mankind to which constellation?

   (a) Bootes (b) Auriga (c) Orion (d) Perseus

6. What constellation has a group of stars called "the Beehive" near its center?

   (a) Taurus (b) Leo (c) Capricornus (d) Cancer

7. What constellation is a queen that was very proud of her beauty?

   (a) Virgo (b) Cassiopeia (c) Pisces (d) Andromeda

8. Which of the constellations look like a house?

   (a) Orion (b) Bootes (c) Cepheus (d) Leo

9. What constellation contains the "Dog Star?"

   (a) Canis Major (b) Canes Venatici

   (c) Aries (d) Canis Minor

10. In Greek mythology, who killed Leo, the most powerful lion ever known?

    (a) Orion (b) Bootes (c) Hercules (d) Perseus

11. What constellation is Lepus directly under?

    (a) Orion (b) Gemini (c) Bootes (d) Leo

12. Of the twelve constellations making up the zodiac, which is the only one not representing something alive?
(a) Lyra (b) Triangulum (c) Crater (d) Libra

13. What constellation is shaped somewhat like the first stringed instrument probably used in Greece?
(a) Libra (b) Crater (c) Triangulum (d) Lyra

14. Only one constellation has two first magnitude stars. What is it?
(a) Taurus (b) Gemini (c) Orion (d) Lyra

15. What figure representing Pegasus can be found today in our modern society?
(a) Doctor's Office (b) Florist's Shops
(c) Oil Company (d) Court House

16. At one time in history the sun was in this constellation on December 21, the shortest day in the year.
(a) Capricornus (b) Cancer (c) Gemini (d) Taurus

17. What was the name of the sea monster that was sent to devour Andromeda?
(a) Draco (b) Capricornus (c) Hydra (d) Cetus

18. What constellation represents the messenger of Apollo?
(a) Corvus (b) Cygnus (c) Aquila (d) Columbia

19. What constellation is sometimes referred to as the Northern Cross?
(a) Aquila (b) Cygnus (c) Vega (d) Bootes

20. How many labors did Hercules have to perform to earn his freedom?
(a) 4 (b) 8 (c) 12 (d) 16

21. Which of the Gemini Twins is the mortal one?
(a) Pollux (b) Apollo (c) Castor (d) Jason

22. What constellation contained the "North Star" at the time the pyramids in Egypt were built?
(a) Cepheus (b) Lyra (c) Cassiopeia (d) Draco

23. What constellation was considered the sacred symbol of the Jewish people?
(a) Libra (b) Pisces (c) Lyra (d) Cygnus

24. What mythology character rode Pegasus to rescue Andromeda from the sea monster?

(a) Bootes (b) Orion (c) Hercules (d) Perseus

25. What did the early Greeks call the strange creatures that were half man and half horse?

(a) Nymphs (b) Muses (c) Centaurs (d) Gods

26. What character, according to Greek myths, killed the great hunter Orion?

(a) Cancer (b) Scorpius (c) Taurus (d) Draco

27. What mythological character is Taurus charging?

(a) Auriga (b) Orion (c) Bootes (d) Perseus

28. The North Star is to be found in what constellation?

(a) Ursa Major (b) Big Dipper

(c) Northern Cross (d) Ursa Minor

29. The Big Dipper is part of what constellation?

(a) Ursa Minor (b) Ursa Major (c) Draco (d) Cepheus

30. What constellation is associated with Ceres, goddess of harvest?

(a) Virgo (b) Cassiopeia (c) Pisces (d) Andromeda

31. What constellation is referred to as the "little dog?"

(a) Canis Major (b) Canis Minor

(c) Ursa Major (d) Ursa Minor

32. Who was the beautiful daughter of King Cepheus and Queen Cassiopeia?

(a) Pisces (b) Virgo (c) Andromeda (d) Juno

33. Which of the following stars are <u>not</u> part of the summer triangle?

(a) Altair (b) Spica (c) Deneb (d) Vega

KEY TEST A

1. c
2. b
3. c
4. d
5. a
6. d
7. b
8. c
9. a
10. c
11. a
12. d
13. d
14. c
15. c
16. a
17. d
18. a
19. b
20. c
21. c
22. d
23. b
24. d
25. c
26. b
27. b
28. d
29. b
30. a
31. b
32. c
33. b

TEST B

1. When the zodiac was first laid out, in what constellation was the sun located during the rainy season of the year?
   (a) Capricornus (b) Cancer (c) Pisces (d) Aquarius

2. Which of the four birds found as constellations was Jupiter's favorite?
   (a) Crow (b) Eagle (c) Swan (d) Dove

3. About 2000 years ago what constellation told the coming of the spring season?
   (a) Aries (b) Pisces (c) Capricornus (d) Aquarius

4. What constellation contains Capella, the most northerly of the fifteen first magnitude stars?
   (a) Cygnus (b) Auriga (c) Draco (d) Bootes

5. The bright star Arcturus belongs to which of the following constellations?
   (a) Bootes (b) Draco (c) Orion (d) Cepheus

6. What two imaginary lines on the earth were named after two constellations in the sky?
   (a) _____ and (b) _____

7. Of all the women for whom places were found in the heavens as constellations, which one was put there to be punished rather than honored?
   (a) Virgo (b) Pisces (c) Andromeda (d) Cassiopeia

8. This is a constellation of a King who played a very minor role to his wife the Queen. Can you name this King?
   (a) Cepheus (b) Orion (c) Perseus (d) Auriga

9. What constellation contains the brightest star that can be seen in the northern hemisphere?
   (a) Auriga (b) Bootes (c) Canis Major (d) Taurus

10. What first magnitude star forms the handle of the sickle found in Leo?
    (a) Sirius (b) Regulus (c) Vega (d) Procyon

11. What is the constellation representing the hare in the sky?
    (a) Cetus (b) Taurus (c) Pegasus (d) Lepus

12. Where can the figure representing the constellation Libra be found today in our modern society?

(a) Hospitals (b) Court Houses

(c) Doctors' Offices (d) Theaters

13. What constellation has a bright star with the same name as a popular small American made car?

(a) Lyra (b) Libra (c) Orion (d) Gemini

14. What constellation represents the greatest hunter of ancient times?

(a) Hercules (b) Perseus (c) Bootes (d) Orion

15. Which of the mythology characters did Perseus use to rescue Andromeda?

(a) Pegasus (b) Cetus (c) Capricornus (d) Taurus

16. The sea goat was chosen to represent this constellation because of its climbing ability and its resistance to the rains and flooding. What is it?

(a) Cetus (b) Draco (c) Capricornus (d) Cancer

17. Who was the hero who killed Cetus and rescued Andromeda?

(a) Perseus (b) Bootes (c) Orion (d) Hercules

18. According to mythology, Corvus, the Crow was changed by Apollo. In what way?

(a) ability to fly (b) size (c) color (d) eyes

19. What constellation is represented by a swan?

(a) Cygnus (b) Aquila (c) Columba (d) Corvus

20. Which of the mythology characters was the strongest man of the ancient world?

(a) Atlas (b) Orion (c) Perseus (d) Hercules

21. Which constellation was used to name NASA's space program involving two astronauts?

(a) Mercury (b) Viking (c) Gemini (d) Apollo

22. How long ago was Thuban, in the constellation Draco, the "North Star?"

(a) 1000 years (b) 3000 years

(c) 5000 years (d) 7000 years

23. What characters did Venus and Cupid turn themselves into to escape a monster dragon?
(a) fish (b) swan (c) crow (d) eagle

24. What mythology character killed Medusa and used her head to kill Cetus the sea monster?
(a) Perseus (b) Hercules (c) Orion (d) Bootes

25. What is the zodiacal character known as the archer?
(a) Perseus (b) Sagittarius (c) Orion (d) Bootes

26. What is the name of the red giant star that represents the heart of the Scorpion?
(a) Sirius (b) Arcturus (c) Spica (d) Antares

27. What constellation contains the famous Crab Nebula?
(a) Orion (b) Taurus (c) Cancer (d) Leo

28. What important star is located in Ursa Minor?
(a) Arcturus (b) Vega (c) Spica (d) Polaris

29. What constellation is often called the "Big Bear?"
(a) Ursa Major (b) Ursa Minor
(c) Little Dipper (d) Bootes

30. What constellation includes the white first magnitude star Spica?
(a) Cassiopeia (b) Bootes (c) Draco (d) Virgo

31. The bright star Procyon is in what star group?
(a) Virgo (b) Bootes (c) Orion (d) Canis Minor

32. What constellation represents a beautiful maiden chained to a rock?
(a) Andromeda (b) Virgo (c) Pisces (d) Diana

33. Which of the following stars are <u>not</u> part of the winter triangle?
(a) Betelgeuse (b) Sirius (c) Procyon (d) Aldebaran

KEY TEST B

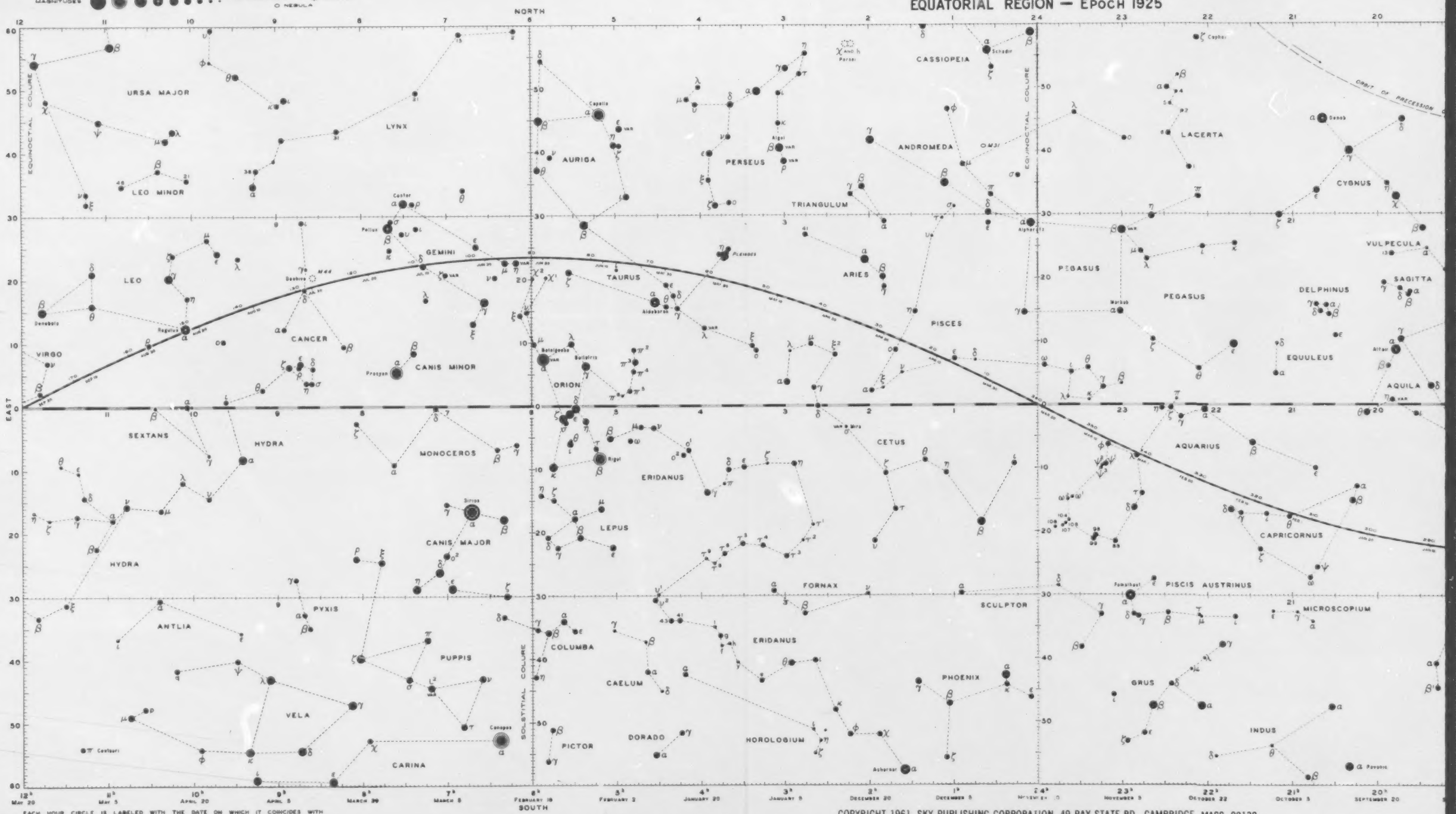
1. d
2. b
3. a
4. b
5. a
6. Tropic of Cancer and Tropic of Capricorn
7. d
8. a
9. c
10. b
11. d
12. b
13. a
14. d
15. a
16. c
17. a
18. c
19. a
20. d
21. c
22. c
23. a
24. a
25. b
26. d
27. b
28. d
29. a
30. d
31. d
32. a
33. d

PRONUNCIATION OF CONSTELLATIONS

Andromeda, an-drom'e-da; Andromeda.
Aquarius, a-kwar' i-us; Water Carrier.
Aquila, ak' wi-la; Eagle.
Aries, ā' ri-ez; Ram.
Auriga, o-rī' ga; Charioteer.
Bootes, bō-ō' tēz; Herdsman.
Cancer, kan' ser; Crab.
Canis Major, kā' nis mā' jer; Big Dog.
Canis Minor, kā' nis mī' ner; Small Dog.
Capricornus, kap' ri-kor' nus; Sea Goat.
Cassiopeia, kas' i-o-pē' ya; Cassiopeia.
Cepheus, sē' fus; Cepheus.
Cetus, sē' tus; Sea Beast.
Corvus, kor' vus; Crow.
Cygnus, sig' nus; Swan.
Draco, drā' ko; Dragon.
Gemini, jem' i-nī; Twins.
Hercules, hur' kū' lēz; Hercules.
Leo, lē' o; Lion.
Lepus, lē' pus; Hare.
Libra, lī' bra; Balance.
Lyra, lī' ra; Lyre.
Monoceros, mō-nos' er-os; Unicorn.
Orion, o-rī' on; Orion.
Pegasus, peg' a-sus; Winged Horse.
Perseus, pur' sus; Perseus.
Pisces, pis' ēz; Fishes.
Sagittarius, saj' i-tā' ri-us; Archer.
Scorpius, skor' pi-us; Scorpion.
Taurus, to' rus; Bull.
Triangulum, trī-ang' gū-lum; Triangle.
Ursa Major, ur' sa mā' jer; Larger Bear.
Ursa Minor, ur' sa mī' ner; Smaller Bear.
Virgo, vur' go; Virgin.

SC1 CONSTELLATION CHART

EQUATORIAL REGION — EPOCH 1925



EACH HOUR CIRCLE IS LABELED WITH THE DATE ON WHICH IT COINCIDES WITH THE MERIDIAN ABOVE THE CELESTIAL POLE AT 9 P.M. LOCAL TIME

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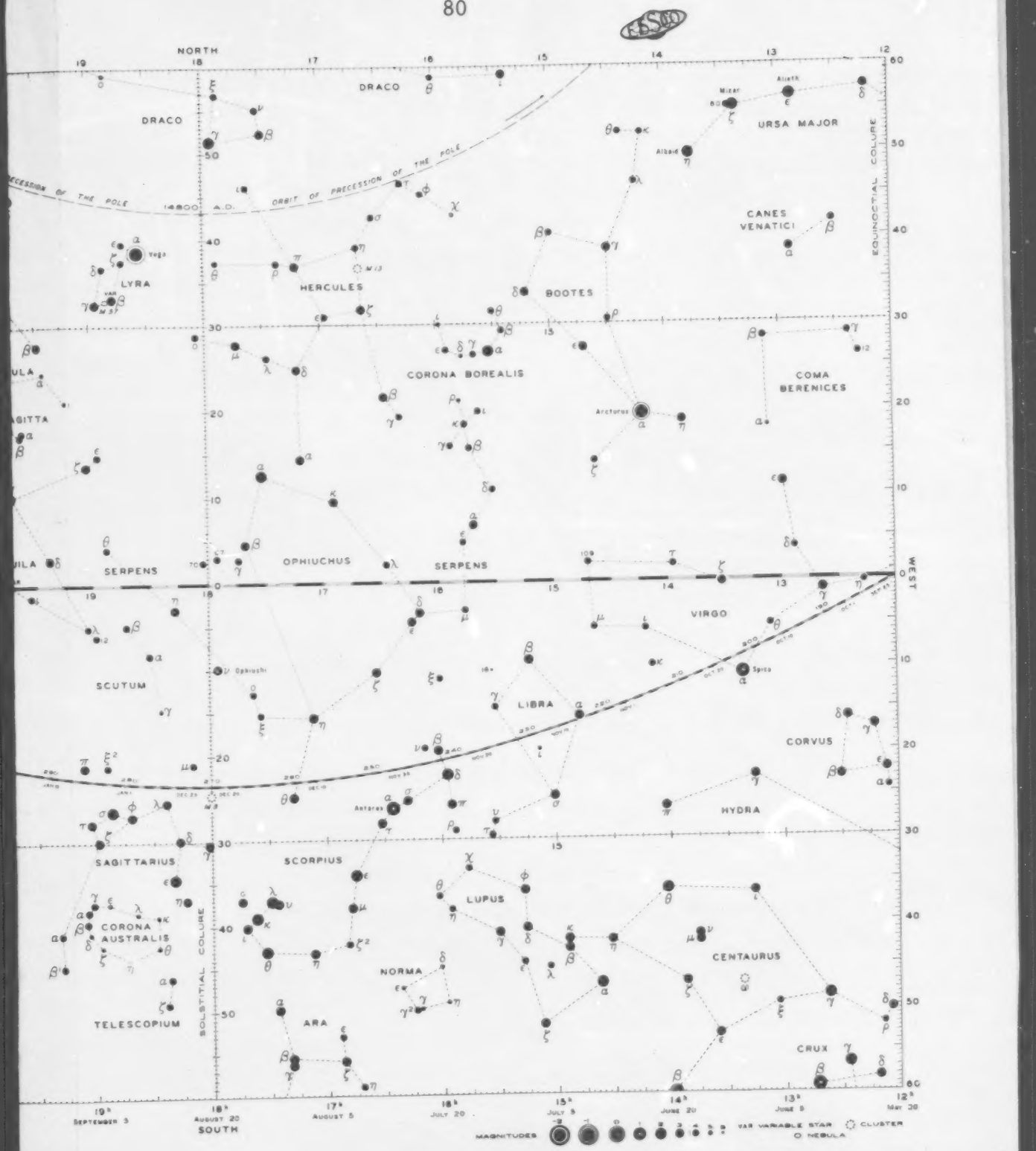
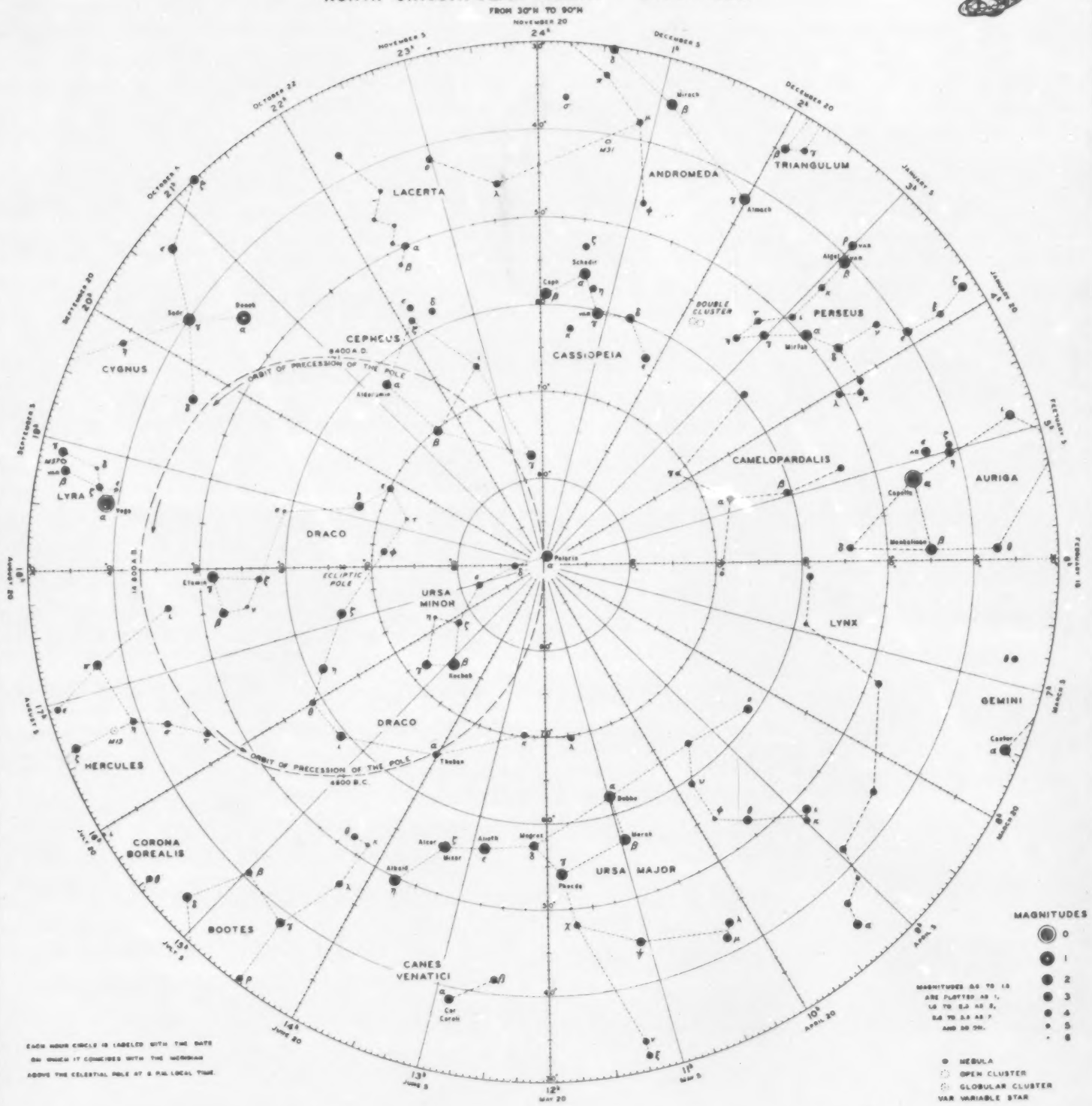

NORTH
DRACO
DRACO
URSA MAJOR
Mizar
Alioth
Alkaid
CANES VENATICI
EQUINOCTIAL COLURE
ORBIT OF PRECESSION OF THE POLE
A.D.
LYRA
Vega
HERCULES
M13
BOOTES
CORONA BOREALIS
Arcturus
COMA BERENICES
SERPENS
OPHIUCHUS
SERPENS
WEST
VIRGO
Spica
SCUTUM
LIBRA
CORVUS
HYDRA
Antares
SAGITTARIUS
SCORPIUS
LUPUS
CENTAURUS
CORONA AUSTRALIS
NORMA
ARA
CRUX
TELESCOPIUM
SOLSTITIAL COLURE
SOUTH
MAGNITUDES
VAR VARIABLE STAR
CLUSTER
NEBULA

SC2 CONSTELLATION CHART

NORTH CIRCUMPOLAR REGION — EPOCH 1925



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THE JANUARY SKY

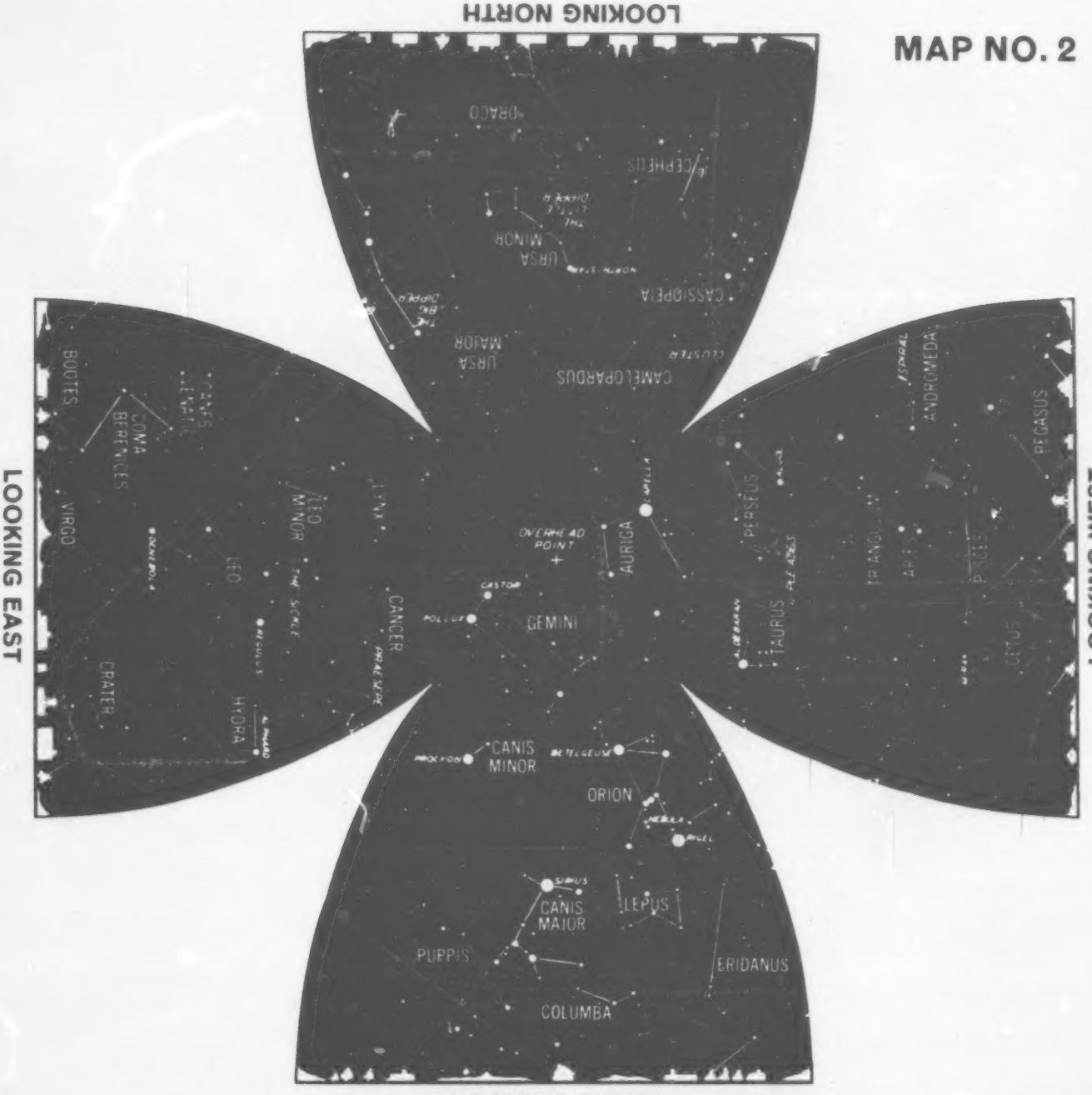
MAP NO. 1

This map represents the sky at the following standard times

JANUARY 1 at 10 p.m.
JANUARY 16 at 9 p.m.
FEBRUARY 1 at 8 p.m.

Take this star chart outside with you when you observe the sky. From STAR MAPS FOR BEGINNERS, Copyright (c) 1942-46, 1964, by I.M. Levitt and Roy K. Marshall, Simon and Schuster, Inc.

THE FEBRUARY SKY



This map represents the sky at the following standard times

FEBRUARY 1 at 10 p.m.
FEBRUARY 15 at 9 p.m.
MARCH 1 at 8 p.m.

Take this star chart outside with you when you observe the sky. From STAR MAPS FOR BEGINNERS, Copyright (c) 1942-46, 1964, by I. M. Levitt and Roy K. Marshall, Simon and Schuster, Inc.

THE MARCH SKY

MAP NO. 3

This map represents the sky at the following standard times

MARCH 1 at 10 p.m.
MARCH 16 at 9 p.m.
APRIL 1 at 8 p.m.

Take this star chart outside with you when you observe the sky. From STAR MAPS FOR BEGINNERS, Copyright (c) 1942-46, 1964, by I. M. Levitt and Roy K. Marshall, Simon and Schuster, Inc.

THE APRIL SKY

This map represents the sky at the following standard times (for daylight saving time, add one hour):

APRIL 1 at 10 p.m.
APRIL 16 at 9 p.m.
MAY 1 at 8 p.m.

Take this star chart outside with you when you observe the sky. From STAR MAPS FOR BEGINNERS, Copyright (c) 1942-46, 1964, by I. M. Levitt and Roy K. Marshall, Simon and Schuster, Inc.

THE MAY SKY

MAP NO. 5

This map represents the sky	**MAY 1 at 10 p.m.**
at the following standard times	**MAY 16 at 9 p.m.**
(for daylight saving time, add one hour):	**JUNE 1 at 8 p.m.**

Take this star chart outside with you when you observe the sky. From STAR MAPS FOR BEGINNERS, Copyright (c) 1942-46, 1964, by I. M. Levitt and Roy K. Marshall, Simon and Schuster, Inc.

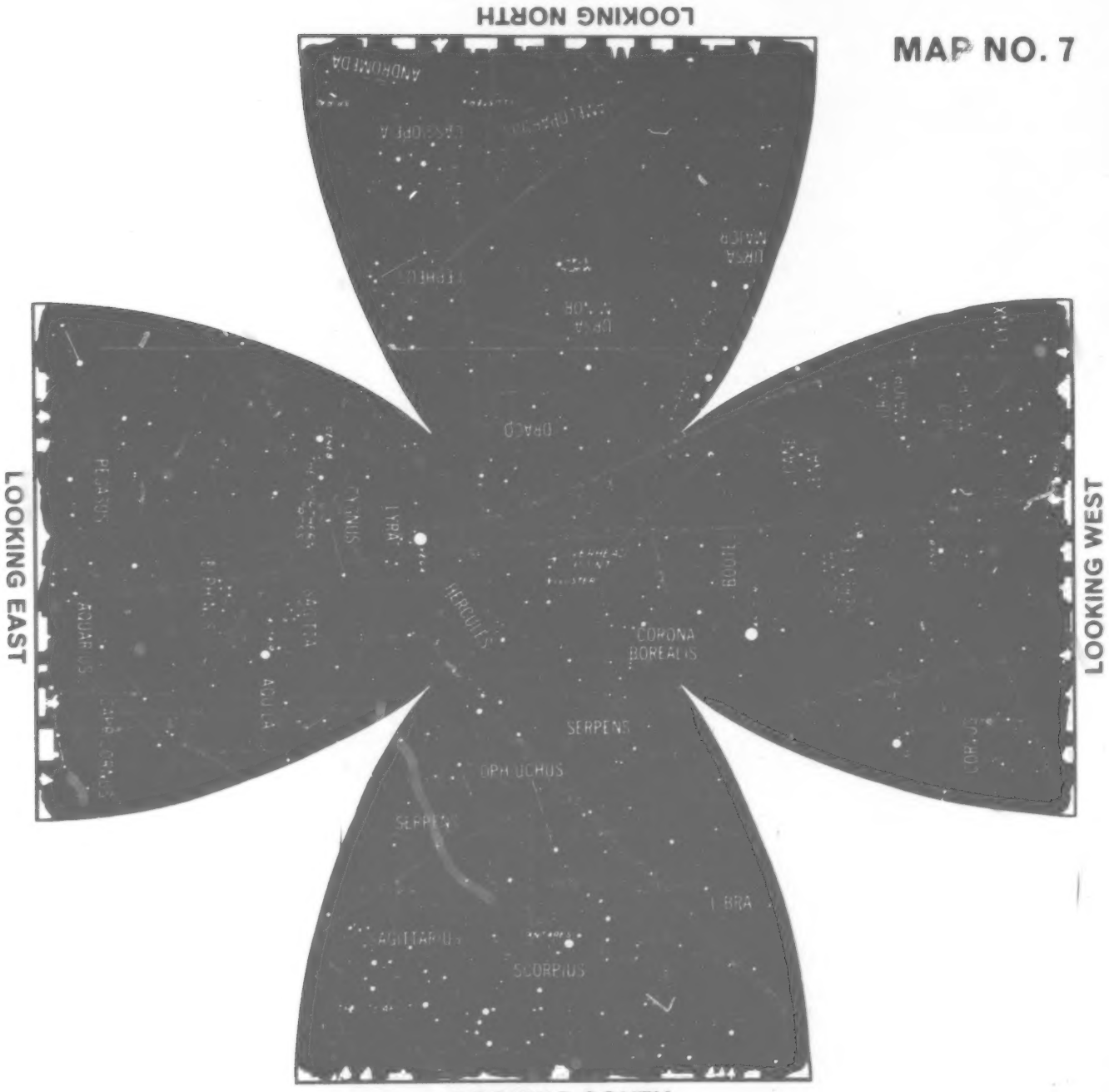
THE JUNE SKY

This map represents the sky at the following standard times (for daylight saving time, add one hour):

JUNE 1 at 10 p.m.
JUNE 16 at 9 p.m.
JULY 1 at 8 p.m.

Take this star chart outside with you when you observe the sky. From STAR MAPS FOR BEGINNERS, Copyright (c) 1942-46, 1964, by I. M. Levitt and Roy K. Marshall, Simon and Schuster, Inc.

THE JULY SKY



This map represents the sky at the following standard times (for daylight saving time, add one hour):

JULY 1 at 10 p.m.
JULY 16 at 9 p.m.
AUGUST 1 at 8 p.m.

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THE AUGUST SKY

This map represents the sky at the following standard times (for daylight saving time, add one hour):

AUGUST 1 at 10 p.m.
AUGUST 16 at 9 p.m.
SEPTEMBER 1 at 8 p.m.

Take this star chart outside with you when you observe the sky. From STAR MAPS FOR BEGINNERS, Copyright (c) 1942-46, 1964, by I. M. Levitt and Roy K. Marshall, Simon and Schuster, Inc.

THE SEPTEMBER SKY

This map represents the sky at the following standard times (for daylight saving time, add one hour):

SEPTEMBER 1 at 10 p.m.
SEPTEMBER 16 at 9 p.m.
OCTOBER 1 at 8 p.m.

Take this star chart outside with you when you observe the sky. From STAR MAPS FOR BEGINNERS, Copyright (c) 1942-46, 1964, by I. M. Levitt and Roy K. Marshall, Simon and Schuster, Inc.

THE OCTOBER SKY

This map represents the sky at the following standard times (for daylight saving time, add one hour):

OCTOBER 1 at 10 p.m.
OCTOBER 16 at 9 p.m.
NOVEMBER 1 at 8 p.m.

Take this star chart outside with you when you observe the sky. From STAR MAPS FOR BEGINNERS, Copyright (c) 1942-46, 1964, by I. M. Levitt and Roy K. Marshall, Simon and Schuster, Inc.

THE NOVEMBER SKY

MAP NO. 11

This map represents the sky at the following standard times

NOVEMBER 1 at 10 p.m.
NOVEMBER 16 at 9 p.m.
DECEMBER 1 at 8 p.m.

Take this star chart outside with you when you observe the sky. From STAR MAPS FOR BEGINNERS, Copyright (c) 1942-46, 1964, by I. M. Levitt and Roy K. Marshall, Simon and Schuster, Inc.

THE DECEMBER SKY

This map represents the sky at the following standard times

DECEMBER 1 at 10 p.m.
DECEMBER 16 at 9 p.m.
JANUARY 1 at 8 p.m.

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